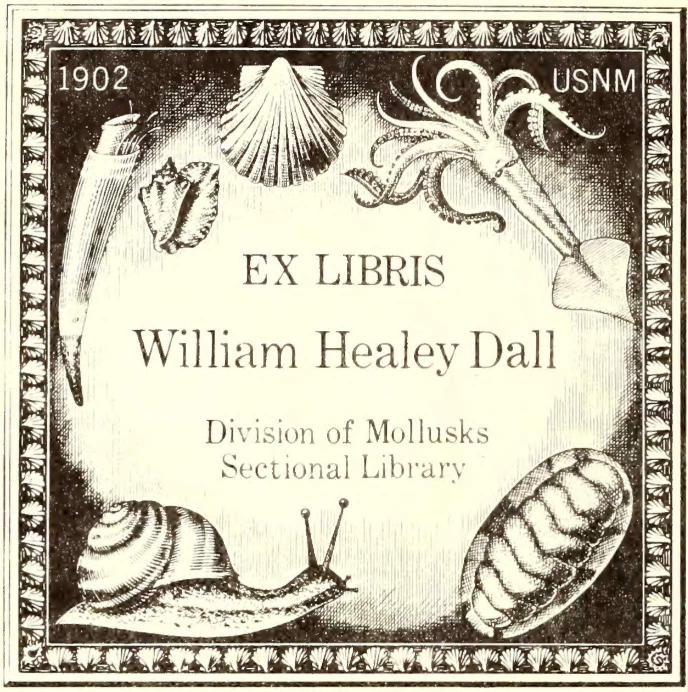

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BARTSCH COLLECTION

Minutes of the Conchological Club of Southern California

January-February 1947

Subscription to all papers published by our club $2.50 per year.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

RECOGNITION- The following excerpt from a recent personal communication to your editor from the Hon. A.E. Salisbury, 51 Amersham Hill, High Wycombe, England, should end the quibbling of a few persons.

" I am very glad that you have now fixed a price on your issue because it thereby becomes a 'PUBLICATION' (how it is produced--mimeographed, printed or whatnot, matters nothing) I have added a note in this year's record that it should be considered a publication now and of course therefore new names occurring therein should be quoted from that source, the issue in which they may appear. I know certain friends have other views but the International Rules permit of no other interpretation as I read them. I might add that this has been discussed by the Nomenclature Committee of the Malacological Society of which I am a member"...

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At intervals these papers have been referred to by members as Proceedings, Notes etc. The correct reference to these papers should always be the Minutes of the Conchological Club of Southern California.

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Some New Publications Received

Johnsonia Vol.2, No.22 " The Genera Bathyaurinia, Rehderia and Scaphella in the Western Atlantic" by William J. Clench. This is a beautifully illustrated work on the Atlantic Volutidae. It is doubtful if any of our members have specimens of species discussed other than *junonia* and this under a multitude of generic names. The proper nomenclature according to Dr. Clench is *Scaphella (Scaphella) junonia* Shaw, 1808.

The Nautilus, Vol.60, No.2, October, 1946 (Received in December). There are a number of fine papers in this issue but one particularly confined to our coast is of special interest to us " A Survey of Some West American Ocenebras, with Description of a New Species" by Mary Bormann. While many of our disputed species are figured and discussed the new species is *O. keenae* named in honor of Dr. A. Myra Keene of Stanford University. Mrs. Bormann is a member of our club and we are very proud of her work in this paper.

" The Classification of Cypraeidae" by Jaques R. Helfer of Mendocino, Calif. is interesting and certainly entertaining. " New Caribbean and Panamic Shells and a Pliocene Marginella" by Maxwell Smith is of interest to us because of our peculiar interest in the Panamic province. " The American Malacological Union-Twelfth Annual Meeting" is reviewed by Mrs. Imogene C. Robertson.

" The Human Blood Flukes" by Paul Bartsch in the Scientific Monthly,Nov. 1946,pp.381-390. This is a continuation of Dr. Bartsch's fine work on this important matter.

Vol. II, Part I of Dr. H.A. Pilsbry's great work " Land Mollusca of North America " has been received. This publication of The Academy of Natural Sciences of Philadelphia is, of course, now in the hands of all interested in land mollusks in any way.

The Journal of Conchology, Vol.22, No.9, 10th Dec.,1946. A nice issue but contains nothing of any interest to the student of our fauna.

Proceedings of the Malacological Society of London, Vol.27, part3, 16 Dec., 1946. This issue contains some papers amazing in their detail, but none of them dealing with species from this coast.

Revista De La Sociedad Malacologica " Carlos De La Torre" of the Museo Poey-Universidad De La Habana, Vol.4, No.3,Dec.,1946. The amazing excellence of this periodical from Cuba should again be mentioned.

Mollusca, Vol.1, No.10, Dec.1,1946 published by Paul H. Reed,Tavares,Florida The new format of this issue seems to be easier on the eyes than the more highly glazed paper. Mr. Reed continues to keep interesting items from here and there in addition to the several scholarly papers. The series of papers on the shells of South Africa continue. There is an interesting paper by Glen R. Webb whom we all recall with pleasure from his visits to our club while stationed here during his service. If you are not now a subscriber to Mollusca the annual subscription rate is $2.50.

More interesting papers have been received from the Conchology Club of Auckland,New Zealand. " Notes on the Volutidae" by Mrs. I. Worthy gives briefly the distinguishing characters of the species that are so often puzzling. Mr. Arthur Richardson's paper " In Search of Paryphanta" and a paper by E.N. Houghton " Collecting in Fiji" are interesting indeed.

****

Mr. Fred C. Hadden,Pago Pago,Tutiula,American Samoa. Mr. Hadden has just moved to Samoa from Honolulu and sends some interesting news. He was in Guam for some time. " I have not been able to do much shell collecting in Samoa, due to lack of transportation. The best collecting grounds are some 10 miles from where I live. Tides were exceptionally low in Oct. and Nov. and it was agonizing to ride by in another person's car and see all that reef exposed and not be able to stop and investigate it. I walked along the shore, mostly cliffs dropping off into deep water near where I live,but collecting here is very poor and very dangerous. The rocks are very slippery and the waves too big most of the time. One could easily be swept off into the turbulent water. * I may possibly be in Los Angeles or Compton where my brother lives in a few months on a vacation. I hope to visit you and perhaps be able to attend a meeting of the club. My friend Dan Langford is still in Guam fighting the African snail. Many of the shells on the rocks and sandy shore here seem to be identical with those we found in Guam. Landshells are rare here in the lowlands. I have been unable to get up into the mountains. I live on a hill near the village of Vailoatoi, only about 2 blocks from the ocean. The recent typhoon Dec.25th,26th flooded the second floor of my house.The lower floor was dry. I have been too busy to unpack the Guam shells".

The following paper on the chitons covering the families Lepidopleuridae and Lepidochitonidae, was written by Allyn G. Smith.

CLASS AMPHINEURA

ORDER POLYPLACOPHORA

Superfamily EOPLACOPHORA

Family Lepidopleuridae

Chitons with head and tail valves similarly articulates, and with the insertion plates either obsolete, or if present, without slits. Girdle finely scaly or bristly. (Pilsbry,Manual, 14:1).

Contains all Paleozoic chitons known and is considered to be the oldest of the chiton families. Species generally range into deep water (100-300 fathoms) but Lepidopleurus benthus Haddon was dredged by the " Challenger" in 2300 fathoms in the north Pacific.

The genus Lepidopleurus, in which several Pacific Coast species have long been placed, was described in 1826 by Risso (Hist. Nat. l'Eur. Merid.,4,p.267). The type, by subsequent designation of Pilsbry,1892, is Chiton cajetanus Poli, 1791. This is not the Lepidopleurus of Carpenter,Dall, and other authors as Pilsbry has shown (Manual,14:2-3). Berry (1917,pp.232-233) pointed out his belief that this genus is not applicable to our relatively delicate,smooth-shelled species because Risso's type is a thick,rugose shell, and also because the genus has been the receptacle for a mixture of species that hardly seem closely related. He therefore reinstates Leptochiton Gray,1847 for Pacific Coast species. Thiele (1929,pp.6,7) treats Leptochiton as a Section of Lepidopleurus. On the basis of the above it seems proper to follow Berry's use of Leptochiton as a genus.

Genus Leptochiton Gray,1847

Type, by subsequent designation (Gray,1847, p.168) Chiton cinereus Montague (not Linne), which Pilsbry, in part (Man. 14 :4), and Dall (Naut. 32:2) place as a synonym of Chiton asellus Spengler,1797. Gray described his genus as follows: " The valves rounded, thin; posterior valve entire;the plates of insertion rudimentary, without any notches on either the terminal or central valves. Mantle covered with granular scales." Thiele (1929, p.7) says: "Shell finely granulates, without strong sculpture,girdle without any particularly long spines."

1. Leptochiton alascensis Thiele,1909.
   Range: " Alaska" (Thiele). Type locality,?
   Remarks: Will someone with access to Thiele's 1909 paper supply the description and other pertinent information on this species ? It is not given in Oldroyd.
2. Leptochiton ambustus (Dall,1919).
   Range: Santa Barbara Channel, 20-40 fathoms (Woodworth),the type locality.
   Remarks: This is a large species for the genus (17 mm. in length),equivalent in size to L. rugatus and L. heathi. It has never been figured

although Dall compares it with L. asellus,type of the genus. Willett (Naut.,49:42) stated his belief that ambustus and heathi both were synonyms of L. nexus and there seems little doubt that the three species are closely related.
Collecting Records: Berry reported it from Monterey in 1907 (Naut. 21:47), on Dall's identification, but his specimens were undoubtedly the species he later described as L. heathi. No authentic specimens have been seen and none has been reported other than the type lot.

3. Leptochiton belknapi Dall,1879.
Range: North Pacific Ocean in lat. 53 68' N.,long. 17 19' W (Aleutian Islands), in 1006 fathoms. (Pilsbry, Man.,14:7).
Remarks: A small, deep-water species, 10 mm. in length.
Collecting Records: None,except for the type lot.

4. Leptochiton cancellatus (Sowerby,1839).
Range: Bering Strait to Sitka and Oregon. Also Atlantic.(Dall). Possibly also from Oregon to Southern California.? Type locality ?
Remarks: This is one of the smallest species known from the West Coast and is generally taken by dredging. It appears to be common in Puget Sound and the British Columbia region. Dall (1879:pp.315-316) says: " The pustules which constitute most of the sculpture are arranged like overlapping coins or a solid-linked chain in lines which in the dorsal area are nearly parallel with the longitudinal axis of the animal. The lateral areas are distinct, and the pustules upon them are arranged in rather indistinct lines radiating toward the lateral ends of the valves, at nearly right angles to the lines on the dorsal area, The sculpture of the mucro is more delicate than elsewhere. The apex of the posterior valve is not sunken and is not so sharp as in other (comparable) species ...; the girdle is scaly,with also some small,spinose,transparent scales near the margin. The lateral areas and other portions of the valves are nearly always colored with blackish or ferruginous patches, but these. . seem to be really composed of extraneous matter."
Specimens that constitute collecting records in the following list from south of Oregon are only provisionally identified as L. cancellatus. Their sculpture is stronger than on specimens from the Puget Sound region,for example, and more nearly resembles that of L. rugatus although they are far smaller and whiter in color than rugatus.
"The name cancellatus is a misnomer, since it is only in certain lights that any trace of reticulation can be observed faintly. The young are flatter than the adults." (Dall,1879, p. 316).
Collecting Records: Alaska, at Unalaska,Shumagins,Port Etches, and Sitka Harbor,6-100 fms. (Dall). Craig,Alaska;Forrester Id.,Alaska 20 fms. (Willett). Port Graham ,Alaska (F. Baker, Naut. 24:25). Queen Charlotte Sound, B.C. (Whiteaves,1887, p. 125). Alert Bay,Queen Charlotte Sound, 20 fms. (Newcombe, Naut., 10:17). Departure Bay (Taylor, Naut. 7:102). Lowe Inlet, B.C., Taylor (Stanford Coll.).Burrard Inlet, B.C., 25 fms., T.S. Oldroyd (Gordon Coll.). Puget Sound, Wash. 25 fms. T.S. Oldroyd (Gordon Coll.). De Poe Bay, Ore., shore (Chace). Albion, Mendocino County, shore (A.G. Smith). Anchor Bay, Mendocino Co., shore, (A.G. Smith). Monterey Bay, 20-50 fms. (Burch, Gordon, A.G. Smith). Off Pt. Joe,Monterey Peninsula,65 fms., from fishermen (E.B. Hunter). Off Redondo,Calif. 25-75 fms. (Burch.).

5. Leptochiton farallonis (Dall,1919).
Range: Farallone Ids., Calif. to Panama, in deep water (Dall).
Remarks: Another unfigured species. The type locality is 391 fms. on coral, off the Farallone Ids. (USFC Sta. 3104).

6. Leptochiton heathi Berry,1919.
Range: Monterey Bay, in 10-35 fms., on shale fragments (type locality, 15 fms.), and possibly at least as far north as Half Moon Bay, Calif.
Remarks: " Particularly marked by its elevated, roundly Gothic-arched outline, poorly delimited lateral areas, steep slope back of the projecting mucro, and minute girdle scales." (Berry,1919, p. 8). This species seems to be closely related to L. nexus and according to Willett (Naut. 49:42) is identical with it.
Collecting Records: A common species dredged on the shale bed in Monterey Bay (Berry,Burch,Gordon,A.G. Smith). A single specimen,provisionally referred to this species was taken from a shale boulder brought up in a fisherman's net off Montara,San Mateo Co. (Half Moon Bay,Calif.) (A.G. Smith).

7. Leptochiton internexus (Pilsbry,1892).
Range: Belkoffski,Alaska, to San Diego, Calif. (Dall). Type locality, Santa Barbara, Calif.
Remarks: This is one of Carpenter's species, validated by Pilsbry. The meagre description and lack of illustration make it difficult to identify without access to the type or other authentic specimens. Dall compares it with L. concinnus Gould, from Hakodadi,Japan, but says it may be distinguished from this by the peculiar girdle covered with subequal scales. (Concinnus has a sculpture like lines of rope).
Collecting Records: No authentic material seen.

8. Leptochiton luridus (Dall,1902).
Range: Puget Sound, Wash., in 48 fms.; Panama Bay, in 1020 fms.. Type locality, Panama Bay, 1020 fms., mud (USFC Sta. 3393).
Remarks: Dall says that in the solidity of its valves, its mucronate jugum,and the arrangement of the pustular sculpture this species seems sufficiently distinct from any of the described species.

9. Leptochiton lycurgus (Dall,1919).
Range: Catalina Island, Calif. (Dall), the type locality.
Remarks: This is another unillustrated species, described as Lepidopleurus (Leptochiton) lycurgus Dall.
Collecting Records: Two minute specimens, dredged by John Burch in 25 fms. off Avalon, Catalina Island, seem to answer the description of this species.

10. Leptochiton mesogonus Dall,1902.
Range: Bering Sea, in 688 fms. Off Queen Charlotte Ids., B.C. in 1588 fms., ooze (USFC Sta. 3342), the type locality.
Remarks: " This species is remarkable for the sharp angle made by the planes of its valves and for the absence of any regional differentiation of its minor sculptue. It is somewhat unusually large (35 mm. in length) for the genus." (Dall,1902, p. 556). Not illustrated.
Collecting Records: None reported other than from the type locality and the Bering Sea record.

11. Leptochiton nexus Carpenter,1864.

Range: Catalina Island to the Gulf of California (Dall). Type locality, Catalina Island, in 20-80 fms.

Remarks: According to Dall (1879, p. 316), nexus " more nearly resembles cancellatus but the sculpture of separate, not lapping, rounded rhomboidal pustules; the mucrones are much more pronounced, and the white ground is prettily marbled with black and gray inherent coloration." Carpenter mentioned a variety " prettily variegated with olive", which has stronger sculpture, the valves slightly beaked and very numerous spicules on the girdle among the striated, elongated scales. He remarked further that it is curiously like the young of Ischnochiton radians.

Collecting Records: White's Pt., Calif. (T.S. Oldroyd,Naut. 25:74). Catalina Island, Oldroyd (Stanford Coll. No. 946), a single topotype. Off Catalina Island (Lowe, Naut. 18:19). Off Redondo Beach, Calif., 25 fms. (Burch). Off Malaga Cove, 10 fms. (Burch). Off Laguna Beach,10 fms. W.A. Hilton (Berry,1919, p. 8). San Diego, C.W. Gripp (Stanford Coll., No. 958).

12. Leptochiton oldroydi (Dall,1919).

Range: Monterey to Catalina Island, Calif. (Dall), Type locality,Monterey, Calif.

Remarks: This small species (5 mm. in length) is immediately and easily identified by the conspicuous pustules, large for the size of the animal,that decorate the lateral areas of the intermediate valves. This is a unique feature for West Coast species of Leptochiton. Described as Lepidopleurus (Leptochiton) oldroydi Dall.

Collecting Records: Monterey Bay, Calif. in 25 fms. (Gordon). White's Pt. from backs of abalones (T.S. Oldroyd, Naut. 25:74). San Diego,Oldroyd (Stanford Coll. No. 941.). Off Catalina Island, 200 fms. (Chace).

13. Leptochiton rugatus (Pilsbry,1892).

Range: Victoria, B.C. (Newcombe) to Todos Santos Bay, Lower Calif. (Dall). Type locality, San Tomas River, L.C.

Remarks: This is a rather large (13-14 mm.) species found usually at low tide or in deep tide pools on the undersides of smooth rocks buried in sand. The foot is liver colored, or of a dark magenta shade. Carpenter, who first described the species in manuscript, considered it a variety of L. internexus. Pilsbry (Man. 14:12) thought that internexus might be the young stage of rugatus, but lack of authentic specimens of the former species makes verification of this impossible at present. Rugatus is a fairly common species along the California coast.

Collecting Records: Near Victoria, B.C. under rocks at low water (Newcombe, on Dall's identification, Naut., 10:19). Fort Bragg,Mendocino Co., Calif., Hemphill (C.A.S.). Anchor Bay, Mendocino Co. (A.G. Smith). Monterey and vicinity (Berry,Gordon,A.G.Smith). San Simeon (Burch). White's Pt. (A.G. Smith). Reef Pt., Orange Co. (A.G. Smith). San Onofre (Burch). Laguna Beach (Mrs. Bradshaw, Naut. 12:9). 5 mi. S. of Laguna (A.G. Smith). San Diego (Stanford Coll. No. 945); Hemphill (C.A.S.). El Morro Pt., L.C. (Burch). Punta Banda, L.C. (Burch). Todos Santos Bay, Hemphill (C.A.S.).

Genus Oldroydia Dall,1894

Type, by original designation, O. percrassa Dall,1894. " Valves separated by narrow extensions of the girdle, reaching to the jugum; jugal area prominent,sculptured differently from the pleural tracts and extending in front of them between the sutural laminae; lateral areas not differentiated; valves heavy, strongly sculptured." (Dall, Naut. 8:90). Originally considered as a Section of Lepidopleurus.

1. Oldroydia percrassa Dall,1894.
   Range: Off Pt. Reyes, Calif. to San Martin Id., L.C. Type locality, from a stone pulled up from about 75 fathoms in the Santa Barbara Channel off San Pedro, Calif. (T.S. Oldroyd)
   Remarks: An odd, roughly sculptured species fairly common in moderate depths of water but sometimes collected on shore at extremely low tide. . It can hardly be mistaken for any other Pacific Coast chiton. Full grown specimens range from 20-25 mm. in length.
   Collecting Records: Shale boulder at Montara,San Mateo Co. (Half Moon Bay), Calif. (A.G. Smith). Monterey Bay on shale, 8-40 fms. (Berry, Burch,Gordon,Smith). Off Santa Monica in 15 fms. (Burch). Off San Pedro Mrs. Baldridge (A.G. Smith). Reef Pt.,Orange Co. (A.G. Smith). Off San Diego in 15-60 fms. (Gripp, Naut. 22:136). Shore, San Martin Id.,L.C. (F. Baker, Naut. 16:42). Yankee Pt., s. of Carmel, E. Hunter (Chace) .

Genus Hanleya Gray,1857

Type, by subsequent designation, Pilsbry,1892, Chiton hanleyi Bean,1844. " Anterior valve having an insertion plate without slits, but roughened; Intermediate and posterior valves having no insertion plates;eaves small; girdle with fine spines; no girdle pores ... This genus differs from Leptochiton in possessing an insertion plate upon the anterior valve." (Pilsbry, Man., 14:17).

1. Hanleya hanleyi (Bean,1844).
   Range: British and Scandinavian Seas. Atlantic (Massachusetts Bay). (Pilsbry, Man. 14:18). Plover Bay, Bering Sea (Thiele,1909, p.15)
   Type locality ?
   Remarks: Included in the list on the basis of Thiele's Plover Bay record.

2. Hanleya spicata Berry,1919.
   Range: From a ledge off Point Pinos, Monterey Bay, California; depth probably 200": H. Heath.... 1 specimen." (Berry).
   Remarks: " This small species (4.5 mm. in length) possesses no very remarkable characters of its own, except the presence of the conspicuous groups of sutural spines on the girdle.... Eventually H. spicata may prove only a variant of the older species (H. hanleyi), but the balance of evidence at the present time appears to me in favor of its distinctness." (Berry, 1919, p. 10).
   Collecting Records: Known only so far from the single specimen collected by Dr. Heath, in Dr. S.S. Berry's collection.

Superfamily Mesoplacophora

Family Lepidochitonidae

This family name is used by Dall in Bull. 112 (P. 188), Iredale and Hull (1925, p. 347), and by Thiele (1929, p.7). Berry (1917, p.231; 1922, p.431) uses the Family Callochitonidae to cover the group. Lepidochitona Gray,1821 is the oldest genus and antedates Callochiton Gray,1847. Recent authors agree in the use of Lepidochitona,Schizoplax, and Nuttallina as genera under the family. However, they vary in the systematic arrangement of species under Lepidochitona. Both Dall and Thiele have rather cumbersome classifications that make liberal use of Sections. Berry uses a simpler arrangement by considering Tonicella,Cyanoplax, and Lepidochitona all of generic rank, which seems reasonable, considering the differences between these groups on the West Coast of North America. Berry's arrangement will therefore be followed.

Genus Lepidochitona Gray,1821.

Iredale (1914, p. 127) states that since Gray listed Chiton marginatus Pennant,? (= cinereus Linne, not of Montagu) as the only species, it became the type, by monotypy. It would seem then, that the type of the genus as now understood is Chiton cinereus Linne, by subsequent designation of Iredale, 1914. Iredale also states that Craspedochilus Sars,1878 is an exact synonym.

" Surface of valves granulated symmetrically, rarely with weak radial or longitudinal ribs or a peculiar arrangement of rather prominent pustules. Head and tail valves with a variable number of slits, the tegmentum honeycombed at the margins. Girdle with tiny oval (langlichen) scales or beset with spicules from which longer spicules project in a single or grouped arrangement." (Thiele,1929, pp. 7,8).

1. Lepidochitona alba (Linne,1767).
   Range: Arctic Ocean to San Diego, Calif. Circumboreal. (Dall).
   Remarks: L. alba is a well known and characteristic Arctic shell and the extension of its range to San Diego is occasion for surprise,unless the record is based on specimens from deep water. Dall states that deep water Alaskan specimens are larger, finer, and display the scales on the girdle better than European specimens. He remarks (1879,pp. 322, 323) that " its chief peculiarity is that the central plates of the tail valve are broken by serrations and that the scales are large and gravelly." The sculpture resembles that of Tonicella ruber Linne, but the granulation is finer.
   Collecting Records: On the Pacific side of the Arctic Ocean south to the Shumagins and west to Kyska and probably to Attu, low water to 80 fms., on stones and shells (Dall,1879).

2. Lepidochitona dentiens (Gould)1846)
   Range: Puget Sound (Gould) to Magdalena Bay and Socorro Island (Dall).
   Type locality, Puget Sound.
   Remarks: Pilsbry (Man. 14:73) redescribes this species somewhat more in detail than the diagnosis given by Gould, as follows:
   " Shell oval, rather elevated, dorsally angled and colored, closely and finely mottled with olive, and having a series of alternating olive

and light spots upon the back edges of the valves along the sutures. These spots are often obscure or wanting, and in some specimens the ground color is a pale orange-flesh tint."

" The valves are covered with a very minute sharp granulation, the granules small but well raised, and on the central areas of some specimens they are somewhat disposed to be arranged in longitudinal lines converging toward the dorsal ridge, this disposition is usually stronger toward the lateral extremities of the valves. The lateral areas are a little raised, the diagonal lines separating them from the central areas rather distinct. The umbo of the posterior valve is median, somewhat raised, the slope behind it being depressed and concave.

" The interior is either whitish or stained with gray-green, or quite green. The sutural plates do not project as far as usual, and on some valves they emarginate in front. The jugal sinus is wide, angular, flat or encroached upon by the jugum. The anterior valve has 11 slits in the insertion plate, the intermediate valves 1, the posterior valve has 10 or 12, and some of the median teeth are bifid at the tip. The girdle is narrow, gravelly, covered with minute scales."

This is a common species of the San Diego region and to the south, found at low tide under rocks and stones. Although Gould gave Puget Sound as the type locality, so far as known it has not been reported from there since; in fact, it has not been collected north of Morro, San Luis Obispo County. One is therefore led to suspect that the label on Gould's type specimens was probably misplaced.

Collecting Records: Morro Rock, San Luis Obispo County, Calif. (Burch). Mugu, Ventura Co. and Malaga Cove, L.A. Co. (Burch). White's Pt., L.A. Co. and Reef Pt., Orange Co. (Smith). Mission Bay (Burch, Smith). La Jolla (Smith). Laguna (Mrs. Bradshaw, Naut. 12:9). 30 mi. N. of Ensenada, L.C. (Burch). San Ignacio Lagoon, L.C., Hemphill (C.A.S.).

3. Lepidochitona sharpii (Pilsbry), 1896

Range: Unalaska, Aleutian Islands, the type locality (Dr. Benj. Sharpe)

Remarks: Known only from the type locality. Spelled " sharpei" by both Dall and Mrs. Oldroyd.

Genus Tonicella Carpenter, 1873

Type, by original designation, Chiton marmoreus Fabricius, 1780. Syn. Boreochiton Sars, 1878. Exterior of shell minutely granulated only, appearing smooth, lateral areas hardly raised. Girdle with very small scales, which are scarcely visible, except in T. ruber, otherwise appearing almost nude. (Thiele, 1929). " Valves, sutural plates, sinus and teeth as in Ischnochiton but the eaves are spongy; girdle as in Tonicia , leathery, smooth or nearly so... The surface of the valves is smooth or evenly microscopically granulated." (Pilsbry, Man.)

1. Tonicella lineata (Wood, 1815).

Range: On the west, the Okhotsk Sea and northern Japan. On the east, from the Aleutian Islands to San Diego, California; low water to 60 fathoms (Dall)

(con.)

Remarks: This is one of the handsomest and also one of the commonest of West Coast chitons, readily distinguished from T. marmorea and T. submarmorea by the absense of microscopic granulation of the surface, as well as by the pattern of coloring. It may be found in deep tide pools and at low tide almost anywhere along the coast north of Monterey. It is less common and smaller toward the southern end of its range,but specimens from the Mendocino County coast are large and fine. " The painting of this very characteristic species is very variable, even on different valves of the same individual. Nothing can appear more distinct than the coloration of typical specimens of some varieties... The southern specimens, especially those from Monterey, generally have the yellow and brown lines marginated with blue, which produces a peculiar color-effect." (Dall,1879:326).

Collecting Records: It would take too much space to cover all the records for this common species,although records from south of Monterey, in addition to those shown would be desirable. A few records follow: St. Paul Id., Alaska Hanna (CAS). Unalaska Id.,Hanna, (CAS). Port Etches (Williams). Seward (F. Baker,Naut. 24:45).Pavlof Bay nr Ivan Id (Williams). Forrester Id. adults at low tide, young in 15-30 fms. (Willett), Naut. 33:27). Puget Sound (F. Baker, Naut. 24:45).Victoria, B.C. (Newcombe,Naut.8/57). Friday Harbor, Puget Sound, Wash. (T.S. Oldroyd, Naut.31:98). Port Angeles and Neah Bay, Wash.,Hemphill (CAS). Crescent City, Calif. (Chaces). Mendocino County coast several localities (Chace, Smith). Pt. Reyes (Smith). Bolinas (Stearns Naut. 28:27). San Francisco Co. (Wood and Raymond, Naut. 5:58). Moss Beach, San Mateo Co. (Smith). Monterey Bay, shore to 35 fms., smaller specimens in deeper water (Burch, Gordon, Berry, Smith). Morro Rock, San Luis Obispo Co., off Haliotis rufescens, small specimens (Burch). San Miguel Id.,Hemphill (CAS). San Pedro or San Diego, Gripp ? (Stanford Coll. No. 943, a single small specimen).

2. Tonicella marmorea (Fabricius,1780).

Range:Arctic and Bering Seas; Aleutian Islands south to Forrester Id., Alaska. Also Japan. Circumboreal. (Dall). Type locality, ?

Remarks: Distinguished from T. submarmorea by the higher arching of the valves. The color markings generally are speckles and maculations of dark red on a buff ground. The shell surface is densely,microscopically granulated as in submarmorea (T. lineata has a smooth surface). The color patern is like that of T. ruber, from which it may be readily distinguished by the smooth, leathery girdle. The average length of Aleutian specimens, according to Dall, is about an inch.

Collecting Records: Aleutian Ids., 8-10 fms., rare, (Dall,1879:325).

3. Tonicella ruber (Linne,1767).

Range: Alaska from the Pribilof Islands westward to Attu and southward to Sitka, low water to 80 fms., on stones and shells; probably also to Bering Strait northward. Widely distributed in northern seas on both North American coasts, and elsewhere. (Dall,1879:321). Type locality ? Forrester Island, (Willett). Dall's extension of the range to Monterey is based on a specimen dredged by Berry, who now considers the record doubtful until confirmed.

Remarks: " This shell is apparently smooth... but under a high power glass appears finely reticulated.. Its color is very variable, being usually marbled red and whitish, like T. marmorea, but the valves may be uniform dark red or nearly pure white. I have seen one specimen with the four central valves dark red and the rest white; one valve in a specimen is often dark red, while all the others are marbled. It is most likely to be confounded with T. marmorea and some varieties of T. lineata, both of which have leathery girdles. While this species can almost always be determined by its farinaceous girdle, dusted with alternate red and whitish patches, the latter nearly opposite the sutures... Though not collected in a fresh state by me north of the Pribilof Islands, I have little doubt that broken valves found in bird dung at Plover Bay, near Bering Strait, are probably referable to this species. It is one of the most abundant Alaskan chitons, and grows to the length of an inch." (Dall,1879:321).

Berry (1917:233) has the following comment on this species: " Balch (Naut. 20:62-68) has remarked at length upon the apparent close relationship of this species and Tonicella marmorea. Ruber had for years been placed by nearly all writers in Trachydermon ...I have come to the conclusion that Trachydermon is quite a different group from what has been generally understood, but .... Sykes (1894:35-37) and Thiele (1910, Revision des Systems der Chitonen, p.107) have shown cause for referring ruber itself to Tonicella.."

Collecting Records: Unalaska, Alaska, Hanna (C.A.S.). Sitka, Harriman Exp. (Gordon Coll., C.A.S.). Forrester Id., 15-30 fms. (Willett, Naut. 33:27). Berry (Naut., 21:47) reported a single specimen from 12 fms. in Monterey Bay, which appears to be the only published record south of Alaska.

4. Tonicella saccharina Dall,1878.

Range: Pribilof, Bering, and Aleutian Ids., in shallow water. San Diego, Calif. in 101 fms. (Dall,1921). Type locality ?
Remarks: " This interesting little species has the lustre of rock-candy, through which the microscopic reticulation is barely perceptible. It is marked in all specimens obtained (Z). , by the red wine colored dorsal areas contrasted with a waxy white color of the lateral areas, rendering its recognition easy. The girdle is dark, leathery, narrow, slightly pubescent, and f furnished at the extreme margin with a fringe of fine spiny hairs or spicules, as in T. marmorea." (Dall,1878:327-328).
Collecting Records: " Aleutian and Shumagin Ids.; Kyska, Unalaska, and Koniushi, 3 to 13 fms., on stones. St. Paul, Pribilof ids., 15 fms." (Dall,1879:327)

5. Tonicella sitkensis (Middendorff,1846).

Range and Type Locality: Sitka, Alaska. (A single specimen).
Remarks: Of this species, Dall (1879:328) says: " The above species described by Middendorff, if not a variety of one of the others, has not yet been identified or collected by any other naturalist. His description differs very much from his figures, while the anterior teeth are figured as grooved outside; if correct, an unusual character. It is said to be nearest T. submarmoreus, and may well be a young specimen of one of its numerous varieties." No subsequent material has been collected to change Dall's statement, made nearly 70 years ago. Pilsbry (Man., 15:67) suggests comparing this species with T. saccharina Dall.

6. Tonicella submarmorea (Middendorff,1846).

Range: Aleutian Islands to Puget Sound. (Dall,1921), Monterey Bay, 10 fms. (Burch).
Remarks: The color pattern of submarmorea, according to Pilsbry (Man. 14:42), is a rosy or yellowish-white, closely painted with spots and flames of red. Specimens from Sitka and British Columbia that have been examines tend toward a reddish-brown ground, with white pencillings,somewhat similar to some of the color varieties of T. lineata, though different in general aspect. Dall (1879:327) thought the resemblance of this color pattern to that of lineata might be due to hybridization, but the close microscopic granulations of submarmorea seem adequate to separate it specifically. A few young specimens of T. lineata dredged in Monterey Bay, show a tendency toward granulation but this character is rare and so weak that it cannot be confused with the microscopic sculpture of submarmorea.

Collecting Records: Sitka,Alaska,Shore, Ricketts (Gordon Coll., CAS). Forrester Id., S.E. Alaska, 15-30 Fms. (Willett, Naut., 33:27). " British Columbia Stations", T.S. Oldroyd (Gordon Coll.). Skidegate Inlet, Queen Charlotte Ids., and Alert Bay, Queen Charlotte Sound, B.C. (Newcombe, Naut. 10:19). Puget Sound: Friday Harbor (T.S. Oldroyd, Naut. 31:98); Orcas Id. (F. Baker,Naut. 24:45); San Juan Ids. Hemphill (CAS).

It is with some surprise that a single specimen, a juvenile, from Monterey Bay, dredged by John Q. Burch, can now be reported, thus extending the range considerably.

Genus Schizoplax Dall,1878.

Type, by original designation, Dall 1878, Chiton brandtii Middendorff,1846. " Shell and girdle as in Tonicella, except that the median valves have a central jugal slit filled with cartilage, narrower in front; tegmentum very spongy; gills extending three-fourths the length of the foot." (Pilsbry, Man., 14:46-47).

1. Schizoplax brandtii (Middendorff,1846).

Range: Bering,Pribilof, and Aleutian Islands, and south to Cape Fox,Alaska.
Type locality: Shantar Bay,Okhotsk Sea.
Remarks: " This form, whilst allied to Tonicella, differs from all other known chitons in the curious slit along the jugum of each of the median valves. This slit is wedge-shaped, narrowing to a point in front, where it is lost in the spongy jugal sinus. The slit is filled with a cartilaginous substrance resembling the ligament of a bivalve. Outside there is a corresponding furrow not extending to the terminal valves." (Pilsbry, Man. 14:47). " This very remarkable species is very prettily marbled with olive,chestnut and blue; the girdle is generally dark olive, dashed with ashy spots and in fine specimens having a pubescent appearance. The slit is occupied by a cartilaginous substrance of a dark brown color, most visible within." (Dall 1879:329).
Collecting Records: Aleutian Ids., eastward to Sitka Harbor, low water to 12 fms. on stones and shells (Dall). St. Paul Id., and Unalaska Is.,Alaska Hanna (CAS). Juneau, Hanna (CAS). Ketchikan,Williams (AGS). Forrester Id. (Willett, Naut. 33:27). Waterfall Cannery, Prince of Wales Id., Alaska, Willett (Berry,1917:235).

2. Schizoplax multicolor Dall,1920

Range and Type Locality: St. Paul Id., Bering Sea (Dall).
Remarks: " This differs from the type of the genus S. brandtii Middendorff in color, form characters of the girdle and depression of the body; S. brandtii has nine slits in the posterior valve which is proportionately larger. If additional specimens confirm its peculiarities, S. multicolor may perhaps form a special subdivision." (Dall, Naut. 34:23).

Genus Spongioradsia Pilsbry,1894.

Type, by original designation, Pilsbry,1894, Trachyradsia aleutica Dall,1878 Valves smoothish having two or several side slits, and extremely spongy eaves and sinus, the latter squared. Girdle sparsely beset with minute elongated scales.

Spongioradsia was proposed by Pilsbry as a subgenus of Carpenter's Trachydermon to cover the type species and S. multidentata Carpenter from the Bonin Islands. Carpenter (in MSS) had included S. aleutica in Trachyradsia , also a subgenus of Trachydermon. Dall in 1921 (Bull. 112,p. 189) considered Spongioradsia to be a subgenus of Lepidochitona Gray, within the Section Cyanoplax Pilsbry. Thiele (1929:8) breaks it out of Cyanoplax ,although retaining its subgeneric status under Lepidochitona. It is here proposed to go a step farther and give full generic rank to Spongioradsia, thus raising it to the same leval as Cyanoplax, which others have also used in a generic sense. There appear to be sound reasons for treating Spongioradsia and Cyanoplax as genera from a taxonomic standpoint. Any views on this proposed arrangement would be welcomed.

1. Spongioradsia aleutica (Dall,1878).

Range: Aleutian Islands (Dall,1921). Kyska Harbor, Kyska Id.; Constantine and Krilof Harbors, Amchitka Id.; and Nazan Bay in the western Aleutians, at low-water mark, under stones on the beach (Dall,1879)
Remarks: " This modest little species is of a dull livid purplish red,with an ashy tinge, especially on the narrow girdle. Except for the well-marked ridges of growth,it appears smooth, but possesses a fine tericulation, only visible under a magnifier. The lateral areas are not distinct, the back is very much rounded, and the valves well hooked in the median line. The substance of the valve from within appears remarkable spongy, as if rotten, or eben like vesicular pumice,especially under the eaves. The anterior slits are marked by radiating lines of holes, though the teeth between them can h hardly be made out. The posterior valve, however,has not this aid in counting and in general sponginess it is almost inpossible to say how many teeth or denticles exist. It hears no marked resemblance to any other species of the region." (Dall, 1879:324).

Genus Cyanoplax (Pilsbry),1892)

Type, by original designation, Pilsbry 1892, Chiton hartwegii Carpenter,1855. " Valves resembling those of Ischnochiton , but having the teeth stout, obtuse,crenulated or bi- or tri-lobed at their tips; and the eaves spongy. Girdle leathery, minutely papillose, Gills extending to the anterior end of

of the foot." (Pilsbry, Man. 14:44).
Cyanoplax was first proposed as a subgenus of Tonicella Carpenter,1873. Dall, in Bull. 112 indicates it as a section of the genus Lepidochitona Gray,1821, but Thiele (1929:8) shows it as a subgenus. Thiele first used this name in a generic sense in 1909 (Rev. Syst. Chit., I, pp.4,7). Berry (1917:231) continued this usage, which is continued here.

1. Cyanoplax fackenthallae Berry,1919.

Range: Pacific Grove to Point Pinos, Calif. Type locality,Pacific Grove (Mrs. Fackenthall).
Remarks: This relatively rare species, whose habitat has only recently been discovered by the Reb. Elwood Hunter and the E.P. Chaces, is extremely close to the southern California species C. lowei (Pilsbry). The major difference is the existence of about ten teeth in the tail valve, compared with about 13 for lowei. It lives in the holdfasts of a shore growing species of kelp, which usually must be torn loose and broken araprt before the chiton is found. Being exactly the color of its habitat it is not easy to see,even when eposed to full view. It has been found only at extreme low tise.
Collecting Records: Great Tise Pool, on the ocean side of Pt. Pinos,Calif. (Chaces,Hunter,A.G.Smith). While no other locality has been reported, it should be found along the coast at least in the vicinity of Monterey Bay wherever the species of kelp in which it lives occurs in sufficient quantity.

2. Cyanoplax hartwegii (Carpenter,1855)

Range: Forrester Island, Alaska to the Gulf of California. Type locality, Monterey (Hartweg)
Remarks: An abundant species, particularly along the California coast,where it lives between tides,generally on exposed smooth rocks covered with seaweed that must often be brushed aside in order to discover them. The subspecies C. hartwegii nuttallii (Carpenter,1855) is now considered to be an exact s synonym of hartwegii. Pilsbry (Man.,14:45) gives the southern end of the range as Magdalena Bay. For an account of this species see Pilsbry, Nautilus '(4)145-46).
Collecting Records: Too numerous to list for such a common species. Cedros Id. (Lowe, Naut., 27:28).

3. Cyanoplax lowei (Pilsbry,1918).

Range: White's Point and Point Firmin,San Pedro, Calif. Type locality,White's Point (Lowe). La Jolla, Calif. (Chaces)
Remarks: The similarity between this species and fackenthallae has already been noted. It is reported to be found in seaweed holdfasts washed up after storms and appears to be a scarce species.
Collecting Records: White's Pt. (Burch) Pt. Firmin, San Pedro (Chace). La Jolla , 2 specimens (E.P. Chace).

4. Cyanoplax raymondi (Pilsbry,1894)

Range: Seward,Alaska, to San Pedro, Calif. Type locality,San Francisco, probably at Fort Point, Calif. (Raymond).
Remarks: A longer, narrower, and more delicately sculptured species than C. hartwegii, with young specimens of which it is most likely to be confused.

Its habitat is frequently the same as for hartwegii ,along with which it is frequently collected. Generally, it is foundlower down the littoral and seems to prefer rock crannie or cracks although the backs of red abalones covered with growths is a favored habitat. It is also to be found in the zone of the abundant pink coralline algae, which is also the habitat of Onchidella along the Mendocino coast of California. While usually dark in color, specimens are occasionally seen with white flames on a greenish ground, or dull red with black blotches on two or more of the valves (generally on numbers iii and vi). A large specimen may be as long as three-quarters of an inch, although most specimens run half an inch or less.

Collecting Records: Seward,Alaska (F.C. Baker, Naut. 24:28). Forrester Island (Willett, Naut. 33:27). Queen Charlotte Sound (Newcombe, Naut. 10:9) Pt. St. George, Calif., Chace (Burch Coll.). Neah Bay, Wash and Crescent City, Calif. (Chace).All along the Mendocino county coast as well as that of Sonoma and Marin counties (A.G. Smith). Bolinas (W.J. Raymond). Moss Beach,San Mateo Co. (A.G. Smith). Pacific Grove and Monterey Peninsula (Burch)(Chace,Berry,Hunter,A.G. Smith). San Simeon and Cayucos,San Luis Obispo Co. (Burch). Pt. Firmin, Los Angeles Co.,Calif. (E.P. Chace.)

Genus Nuttallina Dall,1879

Type, by original designation, Dall,1879, Nuttallina scabra Carpenter MS (= Chiton californicus Reeve,1847).

" Valves exposed, granulated, the lateral areas having 2,head valve numerous low radiating ribs; insertion plates sharp, the slits corresponding in position to external ribs. Mucro behind the middle, the posterior teeth directly forward. Eaves and sinus very spongy. Girdle varying from spiny to scaly." (Pilsbry, Man. 14:277).

This genus was proposed by Carpenter in a table printed in 1873 by the Smithsonian Institution showing the characters of the " Regular Chitons", but according to Pilsbry (Man.,14:xviii) this was not an acceptable publication. The first reviser of Carpenter's MS was Dall (Proc. USNM, v. 1, pp. 281-333,1879), who designated the type as "N. scabra Rve." (p.298) and attributed Nuttallina to " Cpr. MS." (p. 333). It would therefore appear that the genus Nuttallina should really be attributed to Dall,1879 rather than to Carpenter,1879, and certainly not to Carpenter,1873.

Pilsbry divides the genus into two subgenera, Nuttallina s.s. and Middendorffia, the latter not being represented on the West Coast of North America. The description of the subgenus Nuttallina, as given by Pilsbry (Man.,14:278) is as follows:

" Valves exposed, granulated, having long, smooth sharp teeth; the slits of the median valves obsoletely doubled, those of the anterior valve corresponding in position to the external ribs,the teeth not thickened at the edges of the slits; mucro of posterior valve posterior,terminal but not marginal; teeth of posterior valve short, chisel-shaped, directed forward. Eaves and sinus spongy. Girdle bearing short, rigid spines. Gills extending the whole length of the foot. Type N. scabra Cpr.= Ch. californicus (Nutt.) Rve.

1. Nuttallina californica (Reeve,1847)

Range: Straits of Fuca (Dall) to Point Conception, California (Raymond). Remarks: This is a common species, found on wave-washed rocks between tides. The southern end of the range has been worked out by W.J. Raymond (Naut. 7 (12):134), who also adds comments of interest on the differences between this and the following species.
Collecting Records: Too numerous to mention along the California, Oregon, and Washington coast, north of Point Conception, Calif. Former records of californica south of Pt. Conception are probably incorrect and should be labelled fluxa.

2. Nuttallina fluxa (Carpenter,1864)

Range: Point Conception, California to the Gulf of California (Dall).
Remarks: This species was formerly called N. scabra Reeve but was recognized and named fluxa by Carpenter. The interchange of names between scabra,californica and fluxa has been confusing to West Coast collectors and conchologists, but the names now being used appear to have a sound basis.
Collecting Records: Too numerous to list between Pt. Conception and San Diego, Calif., as the species is common and easily collected. Cedros Id., (Lowe, Naut. 27:28).

3. Nuttallina thomasi Pilsbry,1898.

Range: General vicinity of Monterey, California. Type locality, Pacific Grove, in small tide-pools 4 to 8 ft. above mean tide Mark (Thomas).
Remarks: In describing this species, Pilsbry (Proc. Acad. Sci. Philadelphia, 1898, p. 289-290) comments as follows: " This species differs markedly from N. californica ('Nutt.' Rve.) and N. fluxa (Cpr.) in the shorter valves, lack of radial ribs on the anterior and intermediate valves, and more anterior mucro of the posterior valve, and the single slitting of the valves ii to vii. I at first considered it a Middendorffia, but the girdle is like that of Nuttallina, not having the peculiarly modified spines of the Mediterranean Middendorffia.. It lives with a small form of Trachydermon (Cyanoplax) raymondi, which is much more numerous in the tide pools. From that species it may be known by the spiny girdle. Nearly all the specimens collected are much eroded."
Collecting Records: Few conchologists have taken N. thomasi. In addition to the original lot it is reported to have been collected by Dr. Harold Heath (who sent the first specimens to Pilsbry) at Cypress Pt. on the Monterey Peninsula and at Pt. Lobos. Mackenzie Gordon Jr. stated that he found it sparingly in tide pools at Pt. Lobos in the conglomerate toward the south s side of the point. It is understood also that the Rev. E.B. Hunter has taken specimens. The writer has searched for it repeatedly and never found it. It seems to be extremely localized and is probably rare.

Check List of West North American Marine Mollusks - Sept. 1946

by John Q. Burch

Since the publication and distribution of this list a number of new species have been described. The species in the list were numbered, and the following supplemental numbers serve to bring the list to date.

873.1 *Ocenebra keenae* Bormann,1946 Nautilus ,60:40-41
1320.1 *Pediculariella ovuliformis* (Berry),1946 Leaflets in Malacology
Vol.1,No.1, Nov.4,1946 Described as *Pedicularia ovuliformis* Berry
1791.1 *Episcynia devexa* Keen,1946 Nautilus 60:8-11,Pl.1,figs.1-4
Genus *Episcynia* Morch,1875- added also.

The Class Amphineura was also omitted from the above list pending the completion of the work by Allyn G. Smith. An explanation of the arrangement by Mr. Smith follows. Then the species will be listed and numbered consecutively following the last species in the original check list.

This list is provisional. It does not follow Dall's Bull. 121, but is a combination of Dall,Berry,Le Loup and A.G. Smith. It leaves much to be desired in the order of classification, but is something to start on anyway, and any suggestions for a better arrangement will,of course, be welcomed. I have tried to avoid splitting up some of the older genera to any extent. This is the reason for showing Berry's *Dendrochiton* and *Basiliochiton* as subgenera of *Mopalia*,rather than as genera as he undoubtedly considers them. Also, it is impossible to assign species of *Ischnochiton* between the subgenera *Ischnochiton* s.s. and *Lepidozona* correctly until we know much more than we do now of Dall's unfigured species, the types and only material of which are in the National Museum.

All of the chiton names used for West Coast species are included, so far as I can determine. There are undoubtedly too many names for the actual number of species living on the coast but as we know more about many of the rare species a lot of the present names will have to go into the discard. In the list, I have not done any combining,except where recent papers have made changes that seem to me proper. In subsequent discussion of the various species, I may try to suggest some combinations that seem logical,but this will have to come later.

CLASS AMPHINEURA

ORDER POLYPLACOPHORA

LEPIDOPLEURIDAE

Leptochiton Gray,1847
2061. L.alascensis Thiele,1909
2062. L.ambustus (Dall,1919)
2063. L.belknapi Dall,1879
2064. L.cancellatus (Sowerby,1839)
2065. L.farallonis (Dall,1919)
2066. L.heathi Berry,1919
2067. L. internexus (Pilsbry,1892)
2068. L. luridus (Dall,1902).
2069. L. lycurgus (Dall,1919)
2070. L. mesogonus Dall,1902.
2071. L. nexus Carpenter,1864
2072. L. oldroydi (Dall,1919)
2073. L.rugatus (Pilsbry,1892)

Oldroydia Dall,1894
2074. O. percrassa Dall,1894
Hanleya Gray,1857
2075. H. hanleyi (Bean,1844)
2076. H. spicata Berry,1919
Superfamily Mesoplacophora
Family LEPIDOCHITONIDAE
Lepidochitona Gray,1821
2077. L. alba (Linne,1767)
2078. L. dentiens (Gould,1846)
2079. L. sharpii (Pilsbry,1896)
Tonicella Carpenter,1873
2080. T. lineata (Wood,1815)
2081. T. marmorea (Fabricius,1780)
2082.T. ruber (Linne,1767)
2083. T. saccharina Dall,1879
2084. T. sitkensis (Middendorff,1846)
2085. T. submarmorea (Middendorff,1846)
Schizoplax Dall,1878
2086. S. brandtii (Middendorff,1846)
2087. S. multicolor Dall,1920
Spongioradsia Pilsbry,1894
2088. S. aleutica (Dall,1878)
Cyanoplax Pilsbry,1892
2089. C. fackenthallae Berry,1919
2090. C. lowei (Pilsbry,1918)
2091. C. hartwegii (Carpenter,1855)
2092. C. raymondi (Pilsbry,1894)
Nuttallina Dall,1879
2093.N. californica (Reeve,1847)
2094. N. fluxa (Carpenter,1864)
2095. N. thomasi Pilsbry,1898
Family ISCHNOCHITONIDAE
Subfamily Chaetopleurinae
Chaetopleura Shuttleworth 1853
2096. C. beanii (Carpenter,1857)
2097. C. gemma Dall,1879
2098. C. lactica Dall,1919
2099. C. parallela (Carpenter,1864)
2100. C. prasinata (Carpenter,1864)
s.g.Pallochiton Dall,1882
2101. C. languinosus Pilsbry,1892
Subfamily Ischnochitoninae
Ischnochiton Gray,1847
Subgenus Stenoplax Dall,1879
2102. I. biarcuata Dall,1903
2103. I. conspicuus Pilsbry,1892
2104. I. fallax Pilsbry,1892
2105. I. heathiana Berry,1940.
2106. I. sarcosus Dall,1902
s.g. Ischnochiton sensu stricto
2107. I. alascensis Thiele,1910
2108. I. bryanti Dall,1919
2109. I. brunneus Dall,1919
2110. I. corrugatus Pilsbry,1892
2111. I. interstinctus (Gould,1846)
2112. I. lividus (Middendorff,1847)
2113. I. marmoratus Dall,1919
2114. I. newcombi Pilsbry,1892
2115. I. radians Pilsbry,1892
2116. I. ritteri Dall,1919
2117. I scabricostatus Carpenter,1864
2118. I. scrobiculatus (Middendorff,1847
2119. I. venezius Dall,1919
2120. I. veredendiens Carpenter,1864
Subgenus Lepidozona Pilsbry,1894
2121. I. asthenes Berry,1919
2122. I. aureotinctus Pilsbry,1892
2123. I. berryi Dall,1919
2124. I. californiensis Berry,1931
2125. I. catalinae Willett,1941
2126. I. cooperi Pilsbry,1892
2127. I. decipiens Pilsbry,1892
2128. I. gallina Berry,1925
2129. I. golischi Berry,1919
2130. I. listrum Dall,1919
2131. I. mertensii (Middendorff,1846)
2132. I. retiporosus (Carpenter,1864)
2133. I. retiporosus punctatus (Whiteaves,1886)
2134. I. serratus Carpenter,1864
2135.I. sinudentatus Pilsbry,1892
2136 I. stearnsii Dall,1902
Subgenus Rhombochiton Berry,1919
2137. I. regularis (Carpenter,1855)
Subgenus tripoplax Berry,1919
2138. I. trifidus (Carpenter,1864)
Subfamily Callistochitoninae
Callistochiton Dall,1882
2139. C. acinatus Dall,1919
2140. C. aepynotus Dall,1919
2141. C. celetus Dall,1919
2142. C. chthonius Dall,1919
2143. C. connellyi Willett,1937
2144. C. crassicostatus Pilsbry,1893
2145. C. cyanosus Dall,1919
2146. C. decoratus Pilsbry,1893
2147. C. decoratus infortunatus Pilsbry,1893
2148. C. decoratus punctocostatus Pilsbry,1896
2149. C. diegoensis Thiele,1910
2150.C. palmulatus Pilsbry,1893
2151. C. palmulatus mirabilis Pilsbry,
1893

Family CHITONIDAE
Tonicia Gray,1847
2152. T. pustulifera Dall,1919
Family MOPALIIDAE
Amicula Gray,1847
2153. A. pallasii (Middendordd,1847)
2154. A. vestita (Brod. & Sowerby, 1829)
Katharina Gray,1847
2155. K. tunicata (Wood,1815)
Placiphorella Dall,1879
2156. P. borealis Pilsbry,1893
2157. P. pacifica Berry,1919
2158. P. rufa Berry,1917
2159. P. stimpsoni (Gould,1859)
2160. P. velata Dall,1879
Mopalia Gray,1847
Subgenus Mopalia sensu stricto
2161. M. acuta (Carpenter,1855)
2162. M. celetoides Dall,1919
2163. M. chacei Berry,1919
2164. M. chloris Dall,1919
2165. M. ciliata (Sowerby,1840)
2166. M. ciliata wosnessenskii (Middendorff,1847)
2167. M. cirrata Berry,1919
2168. M. egretta Berry,1919
2169. M. goniura Dall,1919
2170. M. hindsii (Reeve,1847)
2171. M. imporcata Carpenter,1865
2172. M. imporcata lionotus Pilsbry, 1918
2173. M. lignosa (Gould,1846)
2174. M. lignosa elevata Pilsbry,1893
2175. M. lowei Pilsbry,1918
2176. M. muscosa (Gould,1846)
2177. M. muscosa laevior Pilsbry,1918
2178. M. muscosa kennerleyi Carpenter, 1864
2179. M. muscosa swanii Carpenter,1864
2180. M. pedroana Willett,1932
2181. M. pherminx Berry,1919
2182. M. porifera Pilsbry,1893
2183. M. sinuata Carpenter,1865
Subgenus Dendrochiton Berry,1911
2184. M. gothica (Carpenter,1864)
2185. M. semilirata (Berry,1927)
2186. M. thamnopora Berry,1911
Subgenus Basiliochiton Berry,1918
2187. M. flectens (Carpenter,1864)
2188. M. heathii Pilsbry,1898
2189. M. lobium (Berry,1925)
Family ACANTHOCHITONIDAE
Acanthochitona Gray,1821
2190. A. avicula (Carpenter,1866)
2191. A. diegoensis (Pilsbry,1893)
Family CRYPTOCHITONIDAE
Cryptochiton Middendorff,1847
2192. C. stelleri (Middendorff,1846)
ORDER APLACOPHORA
Family CHAETODERMATIDAE
Chaetoderma Loven
2193. C. argenteum Heath,1911
2194. C. attenuatum Heath,1911
2195. C. californicum Heath,1911
2196. C. eruditum Heath,1911
2197. C. montereyense Heath,1911
2198. C. nanulum Heath,1911
2199. C. robustum Heath,1911
2200. C. scabrum Heath,1911
Limifossor Heath,1904
2201. L. fratula Heath,1911
2202. L. talpoideus Heath,1911
Family LEPIDOMENIIDAE
Nematomenia Simroth,1893
2203. N. platypoda Heath,1911
Heathia Thiele,1913
2204. H. porosa (Heath,1911)
Dondersia Hubrecht,1888
2205. D. californica Heath,1911
Family NEOMENIIDAE
Pachymenia Heath,1911
2206. P. abyssorum Heath,1911
Alexandromenia Heath,1911
2207. A. valida Heath,1911
Family PRONEOMENIIDAE
Dorymenia Heath,1911
2208. D. acuta Heath,1911.

New Publications

" Marine Ecological Studies on Santa Cruz Island, California", by Willis G. Hewatt, Texas Christian University- Ecological Monographs, 16:185-210,July 1946. In this fine paper Dr. Hewatt has made a genuine contribution giving his findings with many lists of species both littoral and from shallow dredgings. Santa Cruz Island is of particular interest to us because of the fact that it so closely parallels Point Conception considered generally as a dividing line between the southern and northern faunas. It is to be regreted that space will not permit a more detailed review of this interesting work. Besides the many interesting conclusions to be drawn from the faunal lists there are observations such as " ... the writer stood on one spot and counted 97 black abalones, *Haliotis cracherodii.* In some places they were so numerous that as many as five and six specimens were stacked one on the other. "

" A Method for Narcotizing Holothurians" by Willis G. Hewatt- Science,June 25, 1943,Vol.97, No. 2530, p. 588. While not new this paper has just come to the editor's attention, and is recommended to those who have perhaps with others of us struggled to get these animals to relax in brine etc.

" Les Variations chez certains Mollusques Helicidae" par R. Verhaeghe- Bulletin de la Societe Les Naturalistes belges Nov.- Dec.,1946.

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News From and About Members

Wm. K. Emerson,2435 Bancroft St.,San Diego, Calif. We are going to miss Emerson here in southern California but all of his friends are happy with him and wish him every success. He has been appointed to the Division of Mollusks, U.S. National Museum.

Mary W. Cornett,2229 Griffin Ave., Los Angeles 31. Another fortunate one planning a collecting trip to west Mexico.

Mrs. E.E. Winford, Dallas, Tex. " I have a good start on a collection of U.S. land shells ..."

Mrs. Kate Stephens,3746 Park Blvd., San Diego,Calif. " .... with many thanks for the best conchological papers I have seen.." Thank you.

Will H. Galbreath,1132 Summit Ave., Pasadena 3, Calif. " I regret that cannot attend meetings oftener than I have the past year."

Mrs. N. Matzen,P.O. Box 768,Escondido,Calif. " We were at Guaymas,Mex., again in Nov. and had quite a successful time of it. This was out third trip but shells get fewer all the time. The best hunting was at San Carlos Bay. We had a boat and went to little visited areas. We found many live *Conus regularis* The day after Christmas Mr. and Mrs. Boerstler and Miss E. Wilson called."

Mrs. Agnes E. Wolf, 515 Wrightwood Ave., Chicago,Ill. Note the new address.

Dr. James Zetek,Drawer C,Balboa,Canal Zone- " I am swamped terribly-.I will write you soon. You are all doing wonderful work. I wish I could be with you on it. Barro Colorado Island has made a slave of me. My warmestand best that 1947 may be your best."

Dr. L.G. Hertlein, California Academy of Sciences, Golden Gate Park,San Francisco, Calif. " I want to congratulate you on the issue of the two volumes on the gastropods and scaphopods as well as the index. It is all very useful and I can appreciate the time it has taken you to do all the detailed work of assumbling the many scattered letters and publications with pertinent information.

Ernest N. Wilcox,1738 JohnsonAve., San Luis Obispo, Calif. " I look at this index with awe, and wonder how it came through. I would as soon tackle a dictionary."

Dr. Paul Bartsch,Smithsonian Institution, United States National Museum, Wash. 25, D.C. " Thank you for the two monumental volumes, " Distributional List of the West American Marine Mollusks from San Diego, California, to the Polar Seas." They are very welcome additions to our library for I have placed them in the library of the Division of Mollusks." " Incidentally, let me wish you and the Conchological Club of Southern California not only a Merry Christmad and a Happy New Year, but that continued innate urge which has made it one of the most energetic organizations that we have today. My compliments to you all."

Peabody Museum, Harvard University, Cambridge 38, Mass. A number of the members were interested in adding this paper to their libraries. The data follows: " Copies of Donald Tower's paper " The Use of Marine Mollusca and Their Value in Reconstructing Prehistoric Trade Routes in the American Southwest" are available at $1.25 each.

L.M. Wright, Enterprise, Fla. " I feel the very complete index you have so painstakingly completed calls for a lot of praise and maybe ..."

Miguel L. Jaume,13th Street No. 351, Vedado, Havana,Cuba. Mr. Jaume has just issued a list of many Cuban rarities for sale. It is a safe bet he has some not in your collection.

Dr. Charles R. Wright,1502 Sixth St.,Sanger, Calif. - Note new address- " I hope to get busy on my fossil and shell work this year as my quarters get better arranged. Do you have any information of a San Pedro Pleistocene fossil Cymatium closely resembling C. corrugatum tremperi Dall ? Mr. George Willett had told me it was undoubtedly a new species and I am considering calling it either Cymatium willetti or C. corrugatum willetti. You have seen the specimens I have from the Hilltop Quarry location."

Morris K. Jacobson,455 Beach,139 St.,Rockaway,N.Y. Glad to have a nice long letter from Jacobson- first in some time. " Spent a week with Mr. Blakeslee up state and had a marvelous time. collecting all the good spots he knows. He is doing a fine job in his section of the country compiling careful and most complete records ..."

J. Helfer,Mendocino,Calif. " My primary interest in the field of zoology has been the insecta for quite a number of years. While overseas during the war I accumulated some shells and when I tried to put names on them was struck with the inadequacy of the literature on the cowries. This particular group has been my interest and I am only casually interested in other shells at present.

E.J. Post,609 N. Emma St., Tampa, Fla. Thanks for the fine Dox and Oliva. But best of all was the letter advising an improvement in health and active collecting.

Harold Harry,312 Stanford Village,Stanford University, Calif. " ... There is never a lack of things to engage my time and attention here at Stanford. Besides formal class-work, I spent some time during the fall quarter, in reading German papers on Pulmonate morphology. Several of the Germans did some really magnificent work, which seems to have been neglected by most American students; however, the Germans very glibly passed over everything that the Americans have done, so the score is about even. All this was in keeping with the study of the anatomy of Achatina fulica, which study has now been much revised and annotated, though little new in the way of original investigation has been added. It is still far from publishable and probably shall remain so.

Speaking of Achatina: The Oakland Tribune for Sunday, 15 December carries a story and pictures of Achatina fulica on Guam; they state that the snail was introduced there during the Japanese occupation, for food forthe soldiers. However, this account, written for the general public, contains little information not found in Pemberton's paper (Hawaiian Planter's Record, 42:2,1938). Just last week I managed to call on Dr. Hertlein at the California Academy; he is a very inspiring conversationalist, and I learned much in the few hours that I spent with him. Among other things, he called my attention to two live Achatina achatina Linne being exhibited at the Aquarium. I arrived there just at closing time, and had only a brief look at them: two enormous snails, at le least 7 inches long (shell), in a five-gallon tank. There was only a bit of sand and some lettuce with them, and the container was, in my estimation, too moise. .. This pair of snails has already made its debut in print, in the following reference: Dickinson, Wesley H.: August 1946 " Giant West African Land Snails in Captivity" - The Aquarium 15:8 p 151-152 (Innes Publishing Co., Philadelphia). According to the lady at the information desk, Dr. Dickineson is connected with the Public Health Service in Berkeley.... The article states that the snails were collected in west Africa several months previous to Nov. 1945. They were bought by Mr. Dickenson in that month from Mr. "arren E. Buch, Camden, N.J.; the snails were at that time " 7 inches long".

Another paper of interest which appeared in the same magazine: Innes, Wm. T. X July, 1946: " Snails and Other Scavengers"- The Aquarium, 15:7, pp 117-126. This paper figures and discusses the majority of the snails in use by aquarium fanciers in this country. "

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Professor Louis Brand, University of Cincinnati, Cincinnati, Ohio.

" I am sending you some faunal lists in connection with a report I am making for the state of Kentucky. These represent the results obtained in about three years of collecting. I also had the opportunity of inspecting several month's catch of a commercial clam fisherman near Ripley, Ohio and found nothing new to add to the following list."

Mussels Collected in the Licking River at Butler, Kentucky

Actiononaias carinata (Barnes); Amblema costata Rafinesque; Cyclonaias tuberculata (Rafinesque); Cyprogenia irrorata (Lea); Elliptio crassidens (Lam.); Elliptio dilatatus (Rafinesque); Fusconaia ebenus (Lea); Fusconaia flava (Rafinesque); Lampsilis anodontoides (Lea); Lampsilis fallasciosa Simpson; Lampsilis siliquoidea (Barnes); Lampsilis ventricosa (Barnes); Lasmigona complanata (Barnes); Lasmigona costata (Rafinesque); Leptodea fragilis (Raf.); Ligumia recta latissima (Raf.); Megalonaias gigantea (Barnes); Obliquaria reflexa Raf.; Plagiola lineolata (Raf.); Pleurobema cordatum (Raf.); Proptera alata (Say); Ptychobranchus fasciolaris (Raf.); Quadrula metanerva (Raf.); Quadrula nodulata (Raf.); Quadrula pustulosa (Lea); Quadrula quadrula (Raf.); Strophitus rugosus (Swain.); Tritogonia verrucosa (Raf.); Truncilla donaciformis (Lea); Truncilla truncata (Raf.).

Mussels Collected in the Ohio River between Cincinnati and New Richmond, Ohio

All of the above species (except Ptychobranchus) and also the following: Amblema peruviana (Lam.); Anodonta imbecillis Say; Carunculina parva (Barnes); Fusconaia subrotunda (Lea); Fusconaia undata (Barnes); Lampsilis orbiculata (Hildreth); Lampsilis ovata (Say); Lasmigona compressa (Lea); Obovaria olivaria (Raf.); Obovaria retusa (Lam.); Plethobasus cyphyus (Raf.); Quadrula cylindrica (Say); Very Rare Species That Are Probably Verging on Extinction- Cyprogenia irrorata (Lea); Fusconaia subrotunda (Lea); Lampsilis orbiculata ((Hildreth); Obovaria retusa (Lam.); Quadrula cylindrica (Say).

Species formerly found in the Ohio River but now apparently extinct

Arcidens confragosa (Say); Dysnomia flexuosa (Raf.); Dysnomia personata (Say); Dysnomia perplexa (Lea); Dysnomia sulcata (Lea); Dysnomia triquetra (Raf.); Leptodea laevissima (Lea); Leptodea leptodon (Raf.); Plethobasus cooperianus (Lea); Proptera capax (Green).

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The following note may interest your readers- by Professor Louis Brand

Simpsoniconcha ambigua Say (the genus is monotypic) is a fresh water bivalve whose glochidial host is the mud-puppy Necturus maculosus. This species is not included in Call's well-known monograph on The Mollusca of Indiana (1899), but in the Revision (1944) of Goodrich and van der Schalie it is recorded from the White and Wabash rivers. I have found this rare shell, a few dead specimens brought up by muskrats, in the Muscatatuck river of Indiana. Mr. Neil McGinniss, a student at the University of Cincinnati, has also found dead Simsoniconcha in Stone Lick, a small stream in southwestern Ohio flowing into the East Fork of the Little Miami river near Perintown,Ohio.

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Minutes of the Conchological Club of Southern California-December,1946

The Conchological Club of Southern California met at the usual time and place Tuesday, Dec. 3,1946 with 24 members and 3 visitors present. Some of the members had not met with us for some time and it seemed good that they could be back. The visitors were H.D. Schutte, 1931 Johnston St.,L.A., P. Ben-zino, 3019 Baldwin St.,L.A. and Ed Flutot, 1818 Monte Vista Dr., Whittier. All expressed a wish to become members. The announcement was read of the marriage of H. Carroll McGowan and Margaret Stein Steadman Nov. 19,1946 at Santa Barbara, Calif. Motion was made and carried that the secretary express the good wishes of the club that they enjoy a long and happy life. Quite a number of new piblications were noted by the members of the nomenclature committee and discussed by the members. The nominating committee appointed at the Nov. meeting reported as follows: For President- Dr. W.O. Gregg; Vice-president, E.P. Chace; Secretary-treasurer, Effie M. Clark. Motion was made and carried that the nominations be closed and that the secretary be instructed that those nominated be declared duly elected. Dr. Gregg appointed the following committees for 1947:

Nomenclature: A.M. Strong, E.P. Chace, and John Q. Burch
Membership; Morris Caruthers, E.P. Baker, and H.R. Turver
Program: G.A. Kanakoff, H. A. Edwards, and Agnes J. Shumate
Historian: Elsie M. Chace
Editor: John Q. Burch
Special committee on C.C. S.C. reference collection: E.P. Chace, A.M. Strong, and John Q. Burch

The first given in the second part of the program was " Large Fresh-Water Mussels of the Pacific Coast States " by Dr. W.O. Gregg. This was by way of a continuation of the subject from the Nov. meeting. Dr. Gregg brought a large number from his extensive collection and it was supplemented by others brought by E.P. Chace who has also collected these shells extensively. Both likenesses and variations were noted by both collectors as well as possible need for a revision of names in some cases. The second number on the program " A Trip to the Gulf of California" led by H. Arden Edwards of the Southwest Museum proved somewhat of an eye-opener to those of us who had regarded this locality as a far away place arrived at over a burning desert and punishing roads. Mr. Edwards had maps and made one as well- to show where to go and how great the distance. Having made more than one trip and but the day before having returned from the last, he talked down its difficulties till it it more than likely a considerable number more will set face S.E. since while he brought but a small part of his find they were mouth watering enough to whet any collectors appetite. Effie M. Clark.

The Meeting of January-1947

The Conchological Club of Southern California met at the L.A. Co. Museum at 7 :30 P.M., Jan.7,1947 with 15 members present. The nomenclature committee listed the receipt of the Nautilus and Vol. III of Dr. Pilsbry's great work These will be reviewed elsewhere in the Minutes.

There was considerable discussion of committee work but a complete report is yet ready for submission. Following this a motion was made and unanimously carried that Dr. Wm. B. Lloyd of the Cabrillo Museum of San Pedro be elected to membership. The subject " Fossil Deposits of the Newport Bay Area" by Geo. P. Kanakoff, Asst. Curator of Dept. of Paleontology was then presented. It was indeed an eye opener since literally tons of material has been studied with some findings that tend to upset previous opinions as to the age represented by the deposit. Mr. Willett's types of the several new species he described from the deposit were of considerable interest since three of them were named for those present at the meeting. As the closing bell began to ring the meeting was adjourned and those in attendance reluctantly took their way home. Effie M. Clark, Secretary.

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The Long Beach Shell Club

The Long Beach Shell Club met for their Christmas meeting at the home of Mr. and Mrs. Ulrich. The following officers presented by the nominating committee were agreed upon by the club: President, E.P. Chace; Vice president, E.P. Baker; Secretary-treasurer, Ruth E. Eaton; Publication and hostess chairman, Grace Ferris; Historian, Mrs. Bormann; Librarian, Mrs. E.P. Baker.
Mr . Barnett reported on shell collecting on Catalina and exhibited a beautiful series of *Argonauta pacifica*.

The January meeting was held Jan. 12,1947. New president, E.P. Chace called the meeting to order. Reports show that shells are returning to some areas. Shell collectors need permits to visit White's Point. The program was by Dr. Howard R. Hill of the Los Angeles Museum who spoke on " Cones of the South Pacific". More than 300 species are distributed over the southerly area, and 100 fossil species come from all over the world. New Zealand has no cones and Australia's are small. Few are found in the Mediterranean Sea, They vary in size from a fraction of an inch to eight inches with a weight of four pounds. The operculum extends part way over the opening. H. and A. Adams separated the Conidae into genera and subgenera. Dr. Tomlin of the British Mus eum has catalogued both living and fossil cones, and Mr. John Burch owns a copy. The Gloria Maris is the most valuable, 22 specimens are known, and they are mostly in Europe although the National Museum has two specimens. The great interest in the talk was revealed by the general discussion and questions following the adjournment.

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Herman W. Miller,Apartado 1320, San Jose, Costa Rica- We were happy to have a nice long letter from our member now in Costa Rica. " We had planned to leave tomorrow for two or three weeks on the coast of Guanacaste (Pacific). If all goes according to plan we will rent a small boat at Puntarenas and cross over to the south end of the Guanacaste peninsula and see what is around there. If I had more time at my disposal I would try to go around the peninsula and up the coast as far as Puerto Portrero where a lot of species have their type locality. There is a lot of coast here in Costa Rica that needs exploring ... and next year I expect to be in the states again....."

Mrs. E.C. Elliott,1 Marden Road, Payneham, South Australia. We would have been delighted to hear from Mrs. Elliott with whom your editor has corresponded and from whom he has hundreds of beautiful shells over a period of years, but almost along with the nice letter a box was delivered containing exactly fifty seven sets of fine Australian shells, a shell collection in itself.

Mrs. Elliott is at this time particularly interested in *Conus*.

Professor Trevor Kincaid, University of Washington sent the editor of this paper two photos of a puzzling shell from the oyster beds up there. In a huddle over them 4 of us came up with just 4 different ideas. Guess we would have to see the shell itself.

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
March 1947

Subscription $2.50 per year.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news to your editor,
John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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At last the American Malacological Union is to meet on this coast. The meeting is to be held at Pacific Grove, California, June 18 to 21,1947. It is assumed that all members will wish to attend the meeting. Please write Mr. Andrew Sorensen, 247 Granite St., Pacific Grove, Calif. for your hotel reservations.

The tides are favorable for shore collecting at this time, and in addition no doubt some of us will try some deep water dredging. We will certainly have an enjoyable outing.

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" The Naturalist's Lexicon" by Robert S. Woods is a volume that should be added to all natural science libraries. It is the endeavor of this book to facilitate in every way possible the intelligent and efficient use of Greek and Latin terms by taxonomists and biologists. It is a list of 15,000 words used or suitable for use in Biological Nomenclature.

The book contains 300 pages 6x9. Heavy buckram binding. $2.75

If interested send your request to the editor.

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One of the reasons for the announcement of the volume above is that we seem to have been in error not infrequently with our Latin and Greek, Mr. Dwight Taylor,of the Webb School of California, Claremont recently wrote the editor as follows: " Since the genus *Mya* forms the family Myacidae, shouldn't the genus *Solemya* form the family Solemyacidae (Note: We used the family name *Solemyidae* in our work on this family).

The matter was submitted to Dr. Joshua L. Baily Jr. who stated that Solemyacidae is the correct form. Dr. A. Myra Keen advises " Dr. Baily is correct in writing the name Solemyacidae, since myac- is the stem of *Mya*. The emendations *Solenomya*,*Solenimya* etc. are unjustified, and there is no legal reson for *Thiele's usage*." This last was in answer to the editors suggestion that Thiele,1929 in " Handbuch Der Systematischen Weichtierkunde" did not follow the usage advocated. In fact, Theile used the genus *Solenomya* and the family name formed as was his custom Solenomyidae. We used *Thiele's* work rather extensively. We stand corrected but with the satisfaction of having some very eminent company.

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The 3 bound volumes of our Minutes which we have been selling for $15.00 are almost exhausted. If it is the intention of any of the members to add these volumes to their libraries we suggest that you reserve them now. It is doubtful if it would pay to reprint them although we still have the stencils.

George Willett Reprints

Mrs. George Willett has a limited number of reprints of the publications on shells of the late George Willett. Interested members who failed to get any of the following papers may have them gratis by writing Mrs. Willett, 4206 Halldale Ave., Los Angeles 37, Calif.

A New Cardita from the Aleutian Islands and a New Epitonium from Southern California. (Trans. San Diego Soc. Nat. Hist., v.7.no.9, pp. 85-90, pl.5)
Contains description of Cardita umnaka and Epitonium pedroanum.

An Upper Pleistocene Fauna from the Baldwin Hills, Los Angeles County, Calif. (Trans. San Diego Soc. Nat. Hist.v.7, no.30, pp. 379-406, pls.25,26)
Contains description of Rochefortia reyana and Bornia cooki.

Micrariontas of Desert Ranges Bordering the East Side of Coachella Valley and Salton Sink, California. (Bull. So. Calif. Acad. Sci., v.38, Part 1,1939)
Contains description and plate of M. orocopia.

A New Species of Mollusk from the San Pedro Pleistocene- Alabina effiae. (Bull. So. Calif. Acad. Sci., v. 38, Part 3,1939, plate 4)

A New Land Shell from Lower California. (Bull. So. Calif. Acad. Sci., v.39, Part 1,1940, plate 12)
Description of M. chacei.

Northwest American Species of Glycymeris. (Bull. So. Calif. Acad. Sci., v.42, Part 3,1943, plate 12)
Description of G. keenae.

New Species of Mollusks from Redondo, California. (Bull. So. Calif. Acad. Sci., v.43, Part 2, 1944, plate 14)
Description of Nuculana burchi and Volvulella tenuissima.

Acteocina of Salton Sink,Colorado Desert,California (Bull. So. Calif. Acad. Sci., v.44, Part 1, 1945)
Description of Acteocina anomala.

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New Publications

" Speciation in limpets of the genus Acmaea", by Avery Grant Test, Contrib. from the laboratory of vertebrate biology, Univ. of Michigan, no.31, June, 1946, pp. 1-24. It is largely a theoretical discussion of speciation but is based on her observations of West Coast limpets and mentions most of our species.

Proceedings of the Malacological Society of London, Vol.27, part 4,Jan.1947 . There are two papers in this issue. " The Pisidia of Tovelde Klint" by H. Schlesch, and The Lamellibranch family Cyprinidae in the Lower Oolites of England by L.R. Cox.

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John Dyas Parker, Academy of Natural Sciences of Philadelphia- We were glad to have a letter with many interesting notes. We recall Mr. Parker's visits to the club while he was out here and his very interesting talks.

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THE FRESH WATER MOLLUSCA OF CALIFORNIA

INCLUDING A FEW FORMS FOUND IN ADJOINING AREAS

Compiled by Wendell O. Gregg, M.D., assisted by various members and associates of the Conchological Club of Southern California.

Edited by John Q. Burch

INTRODUCTION

The present work is the result of an effort to compile a list of all fresh-water mollusks found in the State of California, along with descriptions, type localities, distributional data and other pertinent information available at this time. The need for such a work has long been felt. The obvious need has inspired the present effort. However, only with the help of our many conchological friends has this work been possible. Original descriptions of each species or subspecies are given when available. Many of the original descriptions are inadequate and incomprehensive. Where these forms have been later redescribed, the later description as well as the original description is given. In giving the distribution, not only are published records considered but also an effort has been made to make this more comprehensive by including unpublished records as based on authentic material whenever available. Doubtful records or records based on faulty identifications have in most cases been ignored or when mentioned are done so with adequate explanation. In listing collecting data no effort has been made to list every locality known but rather to list such localities as will give an idea of the distribution and frequency of occurence.

I am indebted to numerous conchologists for aid in obtaining data and for making available for study a vast amount of material. In particular should be mentioned Mr. and Mrs. E.P. Chace, who turned over to me, for study and disposition, their entire collection of aquatic mollusks, material which they have collected during many years of conchological activity. Allyn G. Smith has made available considerable material which he has personally collected. Dr. Howard R. Hill of the Los Angeles County Museum has kindly aided in obtaining data from the collection in his custody. Much information has been obtained from the splendid collection of Dr. S.S. Berry.

Among the conchologists who have materially aided in identifying material, the following, in particular, should be mentioned: Dr. Frank C. Baker, Stanley T. Brooks, Prof. Junius Henderson, Rev. H.B. Herrington, Dr. J.P.E. Morrison, Dr. Henry A. Pilsbry, Dr. Victor Sterki and Bryant Walker.

(con.)

Dr. Fritz Haas, Charles D. Nelson, Allyn G. Smith, and J.R. le B. Tomlin, have aided in obtaining descriptions from some of the old and scarce publications.

We do not claim this to be a finished product. It is merely a compilation of available data. When this list is completed it is proposed to compile changes and additions which will appear from time to time in the form of supplements.

Except as otherwise indicated, descriptions are taken verbatim from the original source.

Class PELECYPODA Goldfuss

Order PRIONODESMACEA Dall

Superfamily NAIADACEA Menke

" Shell of varied form, normally equivalve, inequipartite, and dimyarian; rarely alate; shell substance nacreous and prismatic, with a conspicuous epidermis; hinge area obscure or amphidetic; ligament parivincular, usually opisthodetic and external; pallial lobes usually free, except for an anal siphon, the pallial line simple; foot normally long, compressed, keeled; byssus obsolete; young usually with a distinct nepionic stage; station usually fluviatile or lacustrine." (Dall.)

Family MARGARITIFERIDAE Henderson, 1929

" Diaphragm incomplete, formed by the gills; posteriorly the outer lamina of the outer gills not connected with the mantle for a considerable distance; anterior end of the inner gills separated from the palpi by a gap; branchial and anal openings ill defined, and the latter not closed above; no supra-anal developed; gills without watertubes or with incomplete tubes, and with scattered interlamellar connections, which in certain places form irregular diagonal rows; marsupium formed by all four gills; larva a small, semicircular glochidium, without distinct hooks; shell elongated; sculpture of the beak concentric; hinge-teeth imperfect; epidermis blackish."(Ortmann.)

The genus *Margaritana* (*Margaritifera*) was first separated from the family *Unionidae* by *Ortmann* who proposed the family *Margaritanidae* (1911). " The chief differences of this family are found in the incomplete gill-diaphragm; in the entire lack of a tendency to approach or to unite the mantle margins to form siphons; in the structure of the gills, which lack regular septa running parallel to the gill-filaments, and, consequently, in the lack of the well-defined water-tubes (ovisacs in the female); in the marsupium being formed by all four gills; and in the small size and globular shape of the glochidium, without true hooks.". Simpson (1914) did not follow Ortmann in separating this genus from the *Unionidae* but most of the later authors have followed Ortmann.

Upon return to the generic name *Margaritifera* instead of *Margaritana*, the family name *Margaritanidae* goes out and the use of *Margaritiferidae* as the family name becomes proper (I.C.Z.N., Art.5). The earliest use of the name *Margaritiferidae* which I am able to find is that by Junius Henderson(1929).

Genus MARGARITIFERA, Schumacher,1816

" Shell elongated, usually arcuate, rounded in front, almost lacking a posterior ridge; beaks rather low, sculpture consisting ofa few coarse, parallel ridges which follow the growth lines; epidermis concentrically striate,brownish or blackish; hinge-teeth generally imperfect or not fully developed, two more or less perfect pseudocardinals in the left valve, and one in the right, often reduced to mere tubercles; laterals short,imperfect or wholly wanting; cavity of the beaks rather shallow." (Walker).

Type: Mya margaritifera Linn.

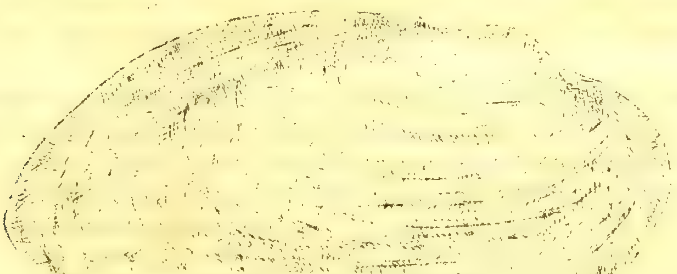
DISTRIBUTION: Circumboreal, with two species in the warmer temperate regions of the United States and one isolated in the Oriental tropics.

Kennard, Salisbury and Woodward (Proc. Malac. Soc. London, XVI,276,1925) show the name Margaritifera is not to be considered as preoccupied by the pre-Linean and polynomial use by Patrick Brown who applied it to a section of pearl oysters in 1756. The name Margaritana Schumacher,1817 , which was proposed as a substitute, must give way to Margaritifera Schumacher,1816 . This is further discussed by Junius Henderson, Nautilus 41:91, and elsewhere.

Margaritifera margaritifera (Linne),1758.

Systema Nat. 10th ed. I, 1758, p. 671.

" Shell large, much elongated, usually arcuate, rounded before and somewhat so behind, rather solid, inequilateral, not inflated; beaks low, not inflated, their sculpture consisting of longitudinal ridges, which are sometimes a little broken; posterior ridge moderate or low, often having a wide, radial depression above it, and ending below the median line, sometimes in a point, in old shells in a rounded termination; surface with rude growth lines; epidermis thick,blackish or brownish, often subshining; left valve with two stumpy pseudocardinals; right valve with one pseudocardinal; laterals generally wanting; beak cavities not deep;muscle s cars impressed, the anterior rough, the posterior elliptical;nacre lurid,bluish-white,whitish,purplish or purple,generally showing pits where the mantle is attached, often having dark blotches. Length 152, height 65, diam. 40 mm. Length 122, height 60, diam. 38 mm. Length 110, height 54, diam. 35 mm." (Simpson,1914, p. 513).



Traced from Walker,1918, p.40, fig. 140.

DISTRIBUTION: " All Europe except the southernmost portion; northern Asia; Japan; northern North America; Iceland. Its southern limit seems to be about north latitude 40 degrees. It appears to be entirely circumboreal, except that, so far as is known, it is missing in the central part of the North American continent. Wetherby has suggested that it may have been destroyed in this region by the ice of the glacial epoch... It is found in the upper Missouri and in Canada East, New York and the New England States." (Simpson, 1914, p. 513).

Along the eastern limit of its distribution in western North America it is reported from Montana on the headwaters of the Missouri River above Fort Benton; Snake River at mouth of Flat Creek, 8 miles south of Jackson, Wyoming; and Green River at Evanston, Wyoming.; and thereare numerous records from Utah. It undoubtedly occurs in Nevada in the Truckee River as it is reported as abundant in California in that same river. Vernon Bailey took it in the East Humboldt River, Nevada (see Stearns,1891, Proc. U.S.N.M. vol. XIV, p.105). From the vicinity of Santa Cruz, California, it extends northward thru Oregon, Washington, Idaho,British Columbia, and is found at Naha Bay, Alaska where Dall (1905, p.132) reported it " abundant near sea level in small lake, Lat. 55 deg. 35 min. North."

DISTRIBUTION IN CALIFORNIA: In California it extends south as far as Santa Cruz. It is reported from the San Lorenzo River below Felton (See Hannibal in Keep's " West Coast Shells",1911, p. 301.). It is reported from the Klamath, Eel, Scaramento, Yuba, and Truckee Rivers; is said to be numerous in the upper Sacramento River near Redding (Keep,1904, p.25). Specimens collected by Tom Burch in the Sacramento River at La Moine measure up to 125 mm. in length. Dall reports it from Plumas county at an altitude of 7,400 feet (1905, p. 132). A.M. Strong has taken specimens from the south fork of the Kern River below Monache Meadows in Tulare county. It probably occurs in most of the clear, swift streams of northern California north of north latitude 37 degrees. It is generally found partly buried in the gravel or sand bottom. Specimens which Tom Burch took from the Sacramento River at La Moine were beneath large stones in about five feet of water.

Shells from western North America are with few exceptions characterized by a brightly colored nacre (interior), ranging thru various shades of purple, orange, and pale blue, but most commonly purple. There has been a tendency for recent authors to reggrd this color form as a distinct subspecies under the name *Margaritifera margaritifera falcata* (Gould,1850). Simpson,(1914) states, " *I have never seen this kind of nacre* in specimens from other parts of the area of distribution of the species, but I do not think such a variation worthy of a varietal name." In old cabinet specimens the color is usually much faded.

Considerablestudy of the glochidial stage of this species was done at the grounds of the San Francisco Fly Casting Club near Truckee, California, which is located on the Truckee River. There was, for a time, an extremely high mortality among young trout in the rearing ponds which received water from the Truckee River. This was found to be due to parasitization by the glochidia of *Margaritifera margaritifera*. The greater the number of glochidia per fish *the higher the mortality rate* while there were no deaths in trout with 30 to 50 glochidia. Of the dead trout examined,as many as 1,200 glochidia were found to infect a single fish. Avoidance of loss was accomplished by not placing trout in the rearing ponds until the " breeding season" of the mussel was past. In this species of mussel, attachment of the glochidium is to the

(con.)

gill filaments of the fish and nowhere else. Researches there showed that rainbow trout (Salmo gairdnerii) and brown trout (Salmo trutta) were the most suitable hosts in the Truckee River. Fish not well suited but possible hosts are the eastern brook trout (Salvelinus fontinalis). Tahoe sucker (Catostomus tahoensis), black minnow (Rhinichthys osculans robustus), and red-sided minnow (Richardsonius egregius). Infections could not be induced in whitefish (Coregonus williamsoni) and the sculpin (Cottus bairdii beldingi). A very interesting account of these studies was given by Garth Murphy (1942, pp. 89-102).

Family UNIONIDAE (d'Orbigny) Ortman,1911

" Diaphragm complete, formed by the gills; posteriorly the outer lamina of the outer gill connected with mantle to its posterior end; anterior end of the inner gills separated from the palpi by a gap; branchial and anal openings shapply separated from one another by the diaphragm; anal opening generally closed and with a supra-anal opening (which very rarely may be obliterated); gills with water-tubes and distinct continuous interlamellar septa, running parallel to the filaments. Marsupium in all four gills, or only in the outer gills; larva a glochidium. Shell of very variable shape; sculpture of the beak more or less reduced, of various types, but originally of the concentric of zigzag pattern; hinge-teeth perfect or imperfect; epidermis plain or with color markings." (Ortmann)

Genus ANODONTA Lamarck,1799

" Shell eliptical, thin, inflated, often slightly winged posteriorly; beak sculpture consisting of rather numerous, more or less parallel ridges, usually somewhat double-looped and becoming slightly nodulous on the loops; surface generally smooth , shining; hinge edentulous, reduced to a mere line, regularly curved; nacre dull. Marsupium occupying the outer gills, when filled forming a smooth, very thick, liver-colored pad." (Walker,1918,-.56).

TYPE: Mytilus cygneus Linne

DISTRIBUTION:" The genus is distributed throughout all or nearly all of North America and the Palearctic region, and is quite abundant in the northern part of the Oriental region." (Simpson, 1914, p. 359).

The Anodontas seem to prefer mud bottoms, though they are sometimes found in sand. They do not usually thrive in aquaria, unless there is a current. A. oregonensis, however, has done very well in aquaria in our laboratory. The shells vary in thickness according to the lime content of the water." (Chamberlin and Jones, 1929, p.24.)

Anodonta beringiana Middendorff,1851.

Sib. Reise,II, 1851, p.284, XXVIII, figs. 4-7; pl. XXIX, figs. 1-4.

" Testa mediocri, ovata, aut ovata-oblonga, ventricossima,perfragili; anterius rotundata,posterius in rostrum obtusatum producta; margine superiore et inferiore subparellelis,rectius-culis; area compressa; umbonibus plane non, aut vix, supra marginem cardinalem prominentibus; sine ligamentali cordatolanceolate. Typ. examplar (taf. 29, f.-13) alt. ad umb. 49 m. alt. summa 55 m., diam. ventr. 41 m.

" Fundort: Lopatka (Kamtschatka); die Insel Unalaschka und die Kuste des Kenaiburens,an dem Nordwestkuste Amerika's."(Mid endorff,1851, p. 284).

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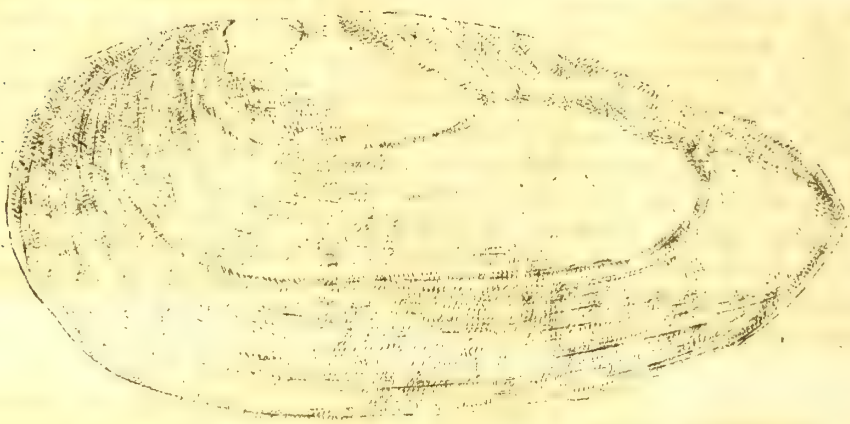
" Shell elongated, irregularly ovate, being a little wider in front, decidedly inequilateral, scarcely subsolid, with a low rounded posterior ridge; beaks low and rather compressed, but the umbonal region below them is full, their sculpture consisting of nearly straight bars, which run almost parallel with the hinge line; post-dorsal wing scarcely developed; surface with low, irregular, concentric ridges; epidermis olive-green, with lighter bands on younger shells, dark green or blackish on old ones; nacre dull bluish or lead-color. Length 140, height 80, diam. 50 mm. Length 155, height 75, diam 52 mm. " (Simpson, 1914, p. 373.)

TYPE LOCALIEY: Not specified.



Traced from Henderson,1929, p. 55.

DISTRIBUTION: Drainage into the Bering Sea from Asia and America and ranging south in the Pacific Coast drainage of North America as far as Rhett (Tule) Lake, California. Dr. Dall lists northern localities (1905,p. 127). Henderson (1929, p. 56) lists the following records in Washington and Oregon: Alger Lake, Beaver Lake, lake one mile north of Cain Lake (Skagit Co.), Campbell, Carination Stock Farms (King Co.), south side of Crescent Lake, Erie Lake, Green Lake (Seattle), Lake Leland (southeast of Sequim), McMurray, Samish Lake (Whatcomb Co.), Scatter Creek at Tenio, Skookumchuck River at Centralia, Tacoma, Whatsom Falls, and Whatcom Lake, all in Washington. Flores Lake (south of Vandom), Ten Mile Lake (Lakeside, north of Coos Bay), and Upper Klamath Lake, all in Oregon. I have received specimens from Walter Eyerdam collected in Green Lake, Seattle, Wash., and Lake Washington King Co., Wash. Mr. and Mrs. E.P. Chace have collected this species in Elk Creek below Drain, Oregon. In the George Willett collection there are specimens from Kodiak, Alaska.

DISTRIBUTION IN CALIFORNIA: There are specimens in the Los Angeles County Museum from Rhett Lake (Tule Lake) in Siskiyou and Modoc Counties. I have been unable to find any other California records.

Described as Anodonta cellensis Schoter var beringiana Midd.

Anodonta youconensis Lea (1867) and A. youkanensis Lea (1868, a later spelling, is considered a synonym. It was described as follows:" Shell smooth, elliptical, very much inflated, very inequilateral, somewhat biangular behind, rounded before; valves somewhat thick, beaks a little prominent, somewhat undulate at the tips: epidermis dark brown, without rays; nacre whitish. This

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species lives in Kamchatka and vicinity." (Lea, Proc. Nat. Sci. Phila., XI, 1867, p. 81. See Keep,1904, p.29).

Anodonta kennerlyi Lea,1860.

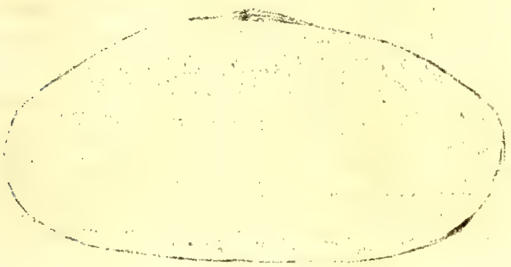
Proc. Acad. Nat. Sci. Phila. IV, 1860, p. 306.

" Shell smooth, elliptical,subcylindrical, somewhat ventricose, very inequilateral, somewhat truncate before, biangular behind; valves very thin, semitransparent; beaks scarcely prominent, finely and closely undulate at the tips; epidermis yellowish olive, shining, striate at the margin without rays; nacre bluish-white and very iridescent." (Lea, see Keep,1904, p.28).

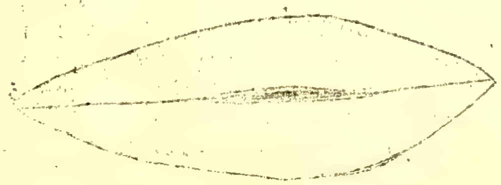
" Shell very thin, much elongated, generally elliptical, scarcely inflated, very inequilateral, the low rather flat beaks being placed near the anterior end, their sculpture not seen; posterior ridge low and rounded; dorsal wing but slightly developed,anterior and sometimes a little truncated;surface dull and concentrically striated behind, rather rough; epidermis greenish-olive or brownish, showing the rest periods quite plainly; nacre bluish-white sometimes a little iridescent behind. Length 93, height 47, diam. 27mm. Length 85, height 42, diam. 27 mm." (Simpson, 1914, p.374).

TYPE LOVALIEY: Chiloweyuck Depot, near Puget Sound, Wash.

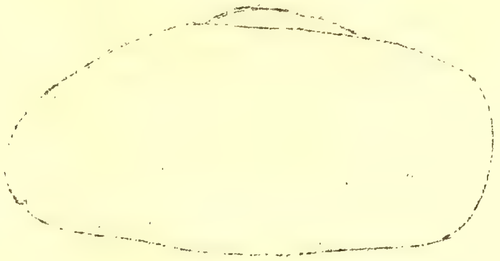
Traced from Lea- Jour. Acad. Nat. Sci. Philadelphia,1862,IV, p.103,pl.18,f. 256.



Outside view shows rather closely striated shell.



Dorsal outline



Inside view.

DISTRIBUTION: British Columbia, Washington and Oregon- J. Henderson (1929, p. 57) lists the following localities: Lake Quinault at Gray's Harbor, Latah Creek (Spokane), Union Gap (neat Yakima) and Samish Lake (Whatcom County), Washington. Eugene, pool seven miles north of Albany and Ten Mile Lake at Lakeside (north of Coos Bay), Oregon. George Willett took specimens at Steilacoon, Wash. Mr. and Mrs. E.P. Chace took it at Elbow Lake north of Reedsport,Oregon.

I have been unable to find any authentic records of occurance in California.

Anodonta oregonensis Lea,1838.

Tr. Am. Phil. Soc., VI, new series, 1838, p.80, pl. XXI, fig.67.

" Testa subalata,elliptica,subinflata,inaequilaterali; valvulis tenuibus; natibus vix prominentibus, as apices undulatis; epidermide subfulgida striataque; margarita alba.

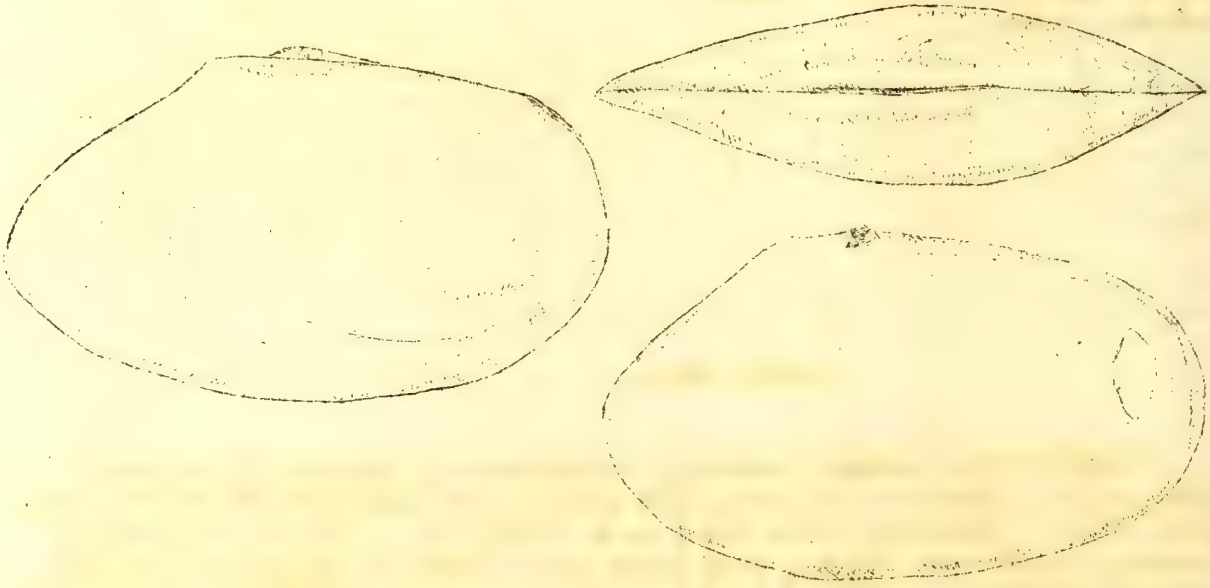
".Shell subalate, elliptical, somewhat inflated,inequilateral; valves thin; beaks scarcely prominent,undulated at the tips; epidermis rather shining and striate; nacre white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall. My cabinet. Cabinet of Professor Nuttall. Diam.1; Length 1.8; Breadth 3.2 inches

" Shell somewhat winged, elliptical, rather inflated, inequilateral; substance of the shell thin; beaks scarcely prominent and undulate at the tip; epidermis somewhat shining and striate; posterior and anterior cicatrices both confluent; dorsal cicatrices placed in the center of the cavity of the beaks; cavity of the shell rather deep; cavity of the beak very small; nacre white.

" REMARKS-- Another species for which I am indebted to Professor Nuttall, procured in his late journey, it has some resemblance to An. cygnea, but is still more closely allied to An. Benedictensis (nobis)." (Lea,1838, p.80).

". Shell long elliptical,inequilateral,moderately strong,scarcely inflated, with rather low, somewhat corrugated beaks, their sculpture consisting of fine, somewhat corrugated bars running generally parallel with the hinge line; dorsal line nearly straight; dorsal wing slightly developed, angled and obliquely truncate behind; posterior ridge low, faintly double and ending in a feeble biangulation behind about on the median line; surface smooth, pale greenish-yellow or yellowish-green, often banded with darker color and showing the rest periods, shining; nacre bluish-white,sometimes tinged with purplish usually thicker in front. Length 114, height 57, diam. 35 mm. Length 94,height 50, diam. 30 mm." (Simpson,1914, p. 375).



Traced from Plate XXI, Figure 67

TYPE LOCALITY: Wahlamat (now spelled Willamette) River near its junction with the Columbia River, Oregon.

DISTRIBUTION: Northern California, Oregon, Washington, British Columbia and extending northward to Kodiak Island, Alaska. Eastward, it extends to Great Sale Lake, Utah.

DISTRIBUTION IN CALIFORNIA: In northern California there are numerous records of this species from the Klamath and Eel Rivers. I have seen specimens fromas far south as Salmon Creek, Marin County (A. Smith).

In this form the dorsal wing is generally less developed than in *californiensis.* The dorsal and ventral margins are more nearly parallel and the posterior end is generally somewhat truncate. " It is larger and much less winged or out away at the dorsal slope than *A. wahlamatensis.*" (Simpson). It was J. Henderson's opinion (1929, p.59) that " This form probably should not be considered more than subspecifically distinct from *A. californiensis.*" Immature or stunted individuals of both species resemble each other very closely and are frequently indistinguishable, but large specimens grown in favorable habitats are very distinct and are readily distinguishable from each other.

" Living specimens from Davis County (Utah) when placed in Mr. Berry's aquarium in October,1928, released numerous glochidia which attached themselves to the Mexican Sword-Tail (*Xyphophorus helleri*) in which they encysted. They also would attach for a time to the Gold-fish and to *Macropodus viridiauratus* but soon dropped off from these without encysting. Other glochidia were shed in an aquarium in the University laboratory in November and again in December ." (Chamberlin and Jones, 1929, p.25).

Anodonta californiensis Lea,1852.

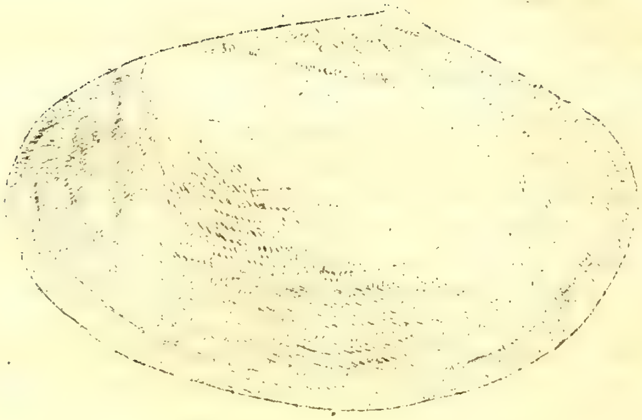
Tr. Am. Phil. Soc., X, 1852, p. 286, pl. XXV, fig. 47.

" Shell subalate, smooth, elliptical,somewhat inflated,rounded behind; valves thin, beaks very small and undulated at the tips; epidermis olive-green, shining; nacre white and iridescent. Smaller and more inflated than *nuttalliana.*" (Lea, see Keep, 1904, p.28).

" Shell very thin, irregularly obovate, subcompressed, its greatest inflation being a little in front of the middle; posterior ridge low, rounded; in front of the ridge the shell is decidedly compressed; dorsal wing considerably developed, angulate behind; post-dorsal slope somewhat truncate; beaks low but sharp, rising above the dorsal line, with a number of rather strong ridges,which nearly follow the growth lines but sometimes are feebly, doubly looped; surface nearly smooth; epidermis shining, greenish or pale olive-green, ashy or pale brownish in the umbonal region,with two or three green rays on the posterior slope; nacre whitish,flesh-colored or lurid purplish, a little thicker in front, soft textured and shining. Length 75, height 40, diam. 18 mm; length 55, height 33, diam. 17 mm." (Simpson,1914, p. 376).

TYPE LOCALITY: Rio Colorado, California.

DISTRIBUTION: California and Oregon; east to Utah and Arizona. According to J. Henderson (1929, p. 56), Utah records are to be questioned and are probably all referrable to *oregonensis.* He lists a number of Oregon localities but questions its occurence in Washington. I have seen specimens from Malheur Lake,Oregon (Willett collection) which are definitely referrable to *A. californiensis.*



Traced from Henderson,1929, P. 56, Fig.3.

DISTRIBUTION IN CALIFORNIA: Anodonta californiensis is a characteristic mollusk of the southern California fauna, being, for the most part, replaced in the northern half of the state by A. oregonensis. There are, however, a number of authentic records of californiensis from the central and northern parts of the state. Of the northern records we mention Quito Creek, Agnew, Santa Clara Co. and Susan River, Susanville, Lassen Co. (both in Berry collection).

In southern California, the species is widely distributed and records are numerous. There are many records from the Los Angeles River. Stearns reported it from the Rio Hondo near Savanah (El Monte). It is reported from Chino Creek, seven miles southwest of Ontario, San Bernardino Co. (Tremper); creek near Fallbrook (Hannibal), and Santa Margarita River at Oceanside (Berry) San Diego Co.; Ballona Creek (Chace), and Arroyo Seco (L.A. Museum), Los Angeles. It is reported from numerous reservoirs and artificial lakes in southern California where it has been introduced in the glochidial stage on fish. A large overgrown form which occurs in lakes has generally been identified as A. californiensis, the large size being ascribed to its ecology. Hannibal considered this to be a northern form which had been introduced with fish from Oregon or Washington. I have seen nothing like it in those states.

In 1930, Morris Caruthers and I took numerous living specimens in the Los Angeles River above Diaz Ave., (now called Coldwater Canyon Blvd.), North Hollywood. The specimens were found in soft mud about the stems of water plants. We also found numerous paired valves in good condition on the banks of the stream further east between Whitsett and Rhodes avenues, where they had been thrown with material from the bottom of the river-bed in dredging operations.

" It is unfortunate that records of Anodonta from southern California are few. The draining of ponds and lagoons and the use of river waters for irrigation so threaten to exterminate it that in a few years it will be almost impossible to obtain an adequate idea of its former distribution." (Hannibal, Jan. 1912, p. 19).

In A. californiensis there is a more pronounced development of the dorsal wing than in A. oregonensis. The posterior end of the shell is more nearly rounded or angular instead of truncate. " Typically this shell is reasonably distinct, but there are a good many specimens that seem to stand

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between it and A. nuttalliana. The obovate form, the contraction in front of the low,rounded,posterior ridge, making the outline in front of this decidedly wedge-shaped when viewed from above or below and the delicate glossy texture within and without are characters of importance in this species." (Simpson, 1914, p. 377)

The fish which serves as host for the glochidial stage of this species is not known to me. The California Roach (Hesperoleucus symmetricus (B. & G) and the Santa Ana Sucker (Notolepidomyzon santa-anae (Snyder) are known to be indiginous in the Los Angeles River and it is suggested that either or both may serve as host.

Anodonta nuttalliana nuttalliana Lea,1838.

Tr. Am. Phil. Soc. VI, new series, 1838, p. 77, pl.XX, fig. 62.

" Testa alata, elliptica, compressa, glabra, inequilaterali; valvulis tenuibus connatisque; natibus compressis, as apices undulatis; epidermide polita; margarita alba.

" Shell winged, elliptical, compressed, smooth, inequilateral; valves thin and connate; beaks compressed and undulated at the tip; epidermis polished; nacre white. Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall. My Cabinet. Cabinet of Professor Nuttall. Diam. .7, Length 1.5, Breadth 2.3 inches.

" Shell winged, elliptical, flattened on the side and enlarged on the umbonial slope, subemarginate at base, smooth, inequilateral;substance of shell thin, the valves being connate over the ligament; beaks compressed and undulated at the tip; umbonial slope furnished with several impressed lines; epidermis smooth and polished, having a dark broad band on the line of growth near the margin; cicatrices scarcely visible; cavity of the shell very small; cavity of the beaks very small; nacre white.

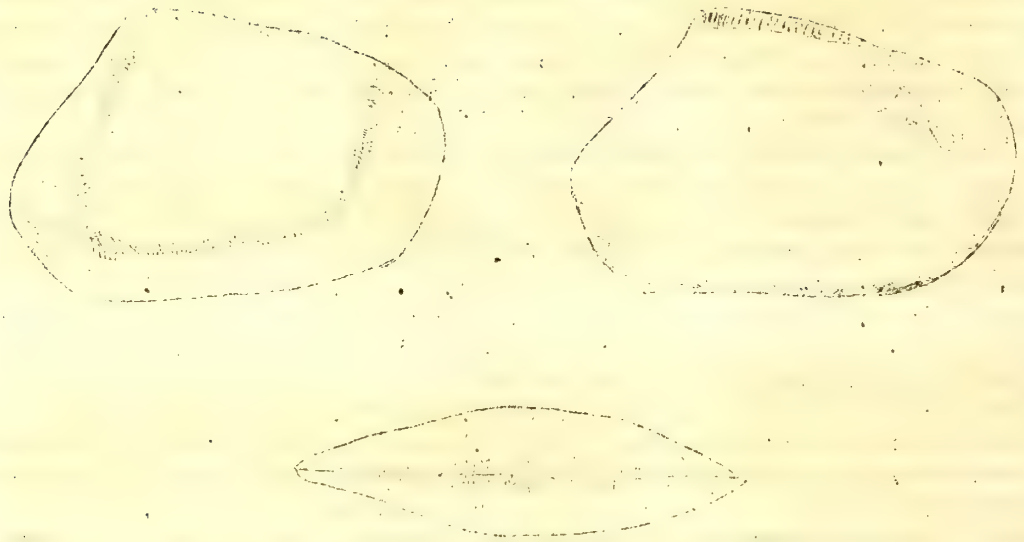
" Remarks.-- I am greatly indebted to the learned and enterprising traveller, Professor Nuttall, for this and two other species of Anodonta, which came from an entirely new locality. The rivers beyond the Rocky Mountains have not before been examined in regard to their mollusca,and we have now for the first time the pleasure of seeing a specimen of this family from these waters. The Wahlamat is the river known in Lewis and Clark's Travels under the name of Multnoma.

" This species has some resemblance to An. Benedictensis (nobis), but may be distinguished by its flattened sides and dark band, as well as its polished surface." (Lea, 1838, p. 77).

" Shell typically subrhomboid, a little narrow in front,thin,convex, with a well-developed post-dorsal wing, which meets the truncation of the posterior slope with a decided angle; posterior ridge scarcely developed through the shell is generally full in this region; beaks compressed, low, but b beginning in a sharp prodissoconch, their sculptures consisting of numerous rather fine, corrugated, concentric ridges; surface with irregular growth lines; epidermis yellowish green, asy or lead-color, scarcely shining, seldom having feeble rays; nacre bluish white, rather dull, sometimes a little irridescent behind. Length 70, height 47, diam. 27 mm." (Simpson,1914,p.377).

TYPE LOCALITY: Wallamat (now spelled Willamette) River near its junction with the Columbia River, Oregon.

DISTRIBUTION: British Columbia; south to Central California; east to Utah.



Traced from Lea,1838, Plate XX, Figure 62

DISTRIBUTION IN CALIFORNIA: Specimens from the following localities are referred to nuttalliana though none of them are quite typical: San Joaquin River; Mountain Lake, San Francisco; Guadalupe Creek drainage and Coyote Creek at Alviso, Santa Clara Co. (Berry); Tulare Lake at Corcoran, Kings Co.)(L.A. Museum).

The status of Anodonta nuttalliana Lea is still somewhat uncertain, A large series of specimens fromthe type locality should help to clear things up.

" This species, if species it may be called, seems to stand about midway between the rude, dark, dull colored A. wahlamatensis and the delicate shining A. californiensis. Dr. R.E. C. Stearns believes that all three of these forms run together and there is much ground for such a position, as there is a good deal of material which, cannot be satisfactorily assigned to any of the three. The same thing, however, may be said of most of the closely related forms of Anodonta wherever theyare found. A. nuttalliana is more rhomboid, is stronger and duller colored than A. californiensis. It is less robust than A. wahlamatensis, the wing is not so high, the posterior slope is rarely incurved, the posterior point is not so decided and the color is not as dark." (Simpson, 1914, p.:378). R.E. Call (1884, p. 14) lists A. wahlamatensis, A. oregonensis, and A. californiensis as synonyms of Anodonta nuttalliana Lea, citing Stearns, Proc. Cal. Acad. Sci., Nov. 20,1882, p 4 et seq., " In this paper a great array of facts is brought out, together with the necessary data to render the synonymy as here given absolutely certain.". In a later publication (1902, p. 287), Stearns refers to A californiensis without any reference to its being a synonym, subspecies, or variety. Had Stearns forgotten his former decision or had he changed his opinion ?

(con.)

Anodonta nuttalliana wahlamatensis Lea,1838.

Tr. Am. Phil. Soc. VI, new series, 1838, p.78, pl.XX, fig.64.

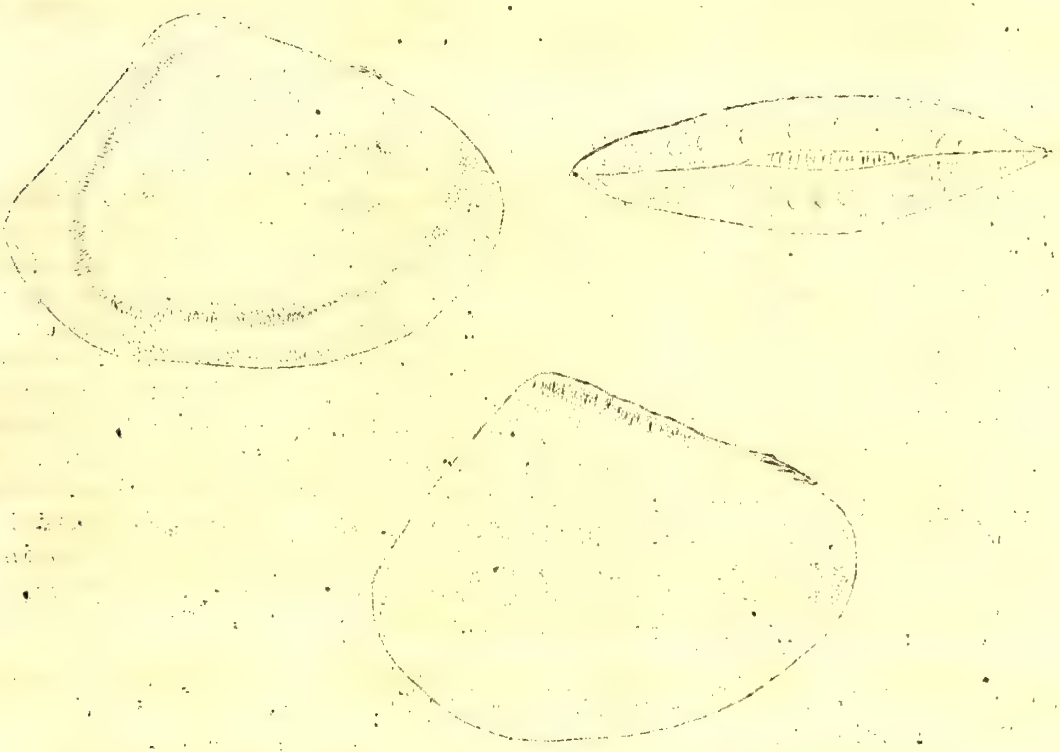
" Testa alata,triangulari,subinflata inaequilaterali; valvulis tenuibus connatisque; natibus subcompressis, ad apices undulatis; epiderme subfulgida : margarita alba.

" Shell winged, triangular, somewhat inflated, inequilateral; valves thin and connate; beaks rather compressed and undulated at the tip; epidermis somewhat shining; nacre white.

Hab. Wahlamat, near its junction with the Columbia River. Professor Nuttall. My Cabinet. Cabinet of Professor Nuttall. Diam. .8, Length 1.8, Breadth 2.5 inches.

" Shell winged, triangular, inflated on the lower posterior part, inequi-lateral; substance of the shell thin, the valves being connate over the ligament; beaks rather compressed, undulated at the tip, and yellow as far as the first stage of growth; epidermis rather smooth and shining, having a small dark band at the line of growth near the margin; cicatrices scarcely visible; cavity of the shell shallow; cavity of the beaks very shallow; nacre white.

Remarks.-- This is one of the species brought by Professor Nuttall from his late expedition to the Columbia River over the Rocky Mountains. It has some resemblance to Nuttalliana, but cannot be easily mistaken for that species, being different in outline and more inflated. In its outline and in the inflation of the lower porterior portion of the shell, it resembles Alas. complanata (Barnes). Professor Nuttall also met with this and the above species in Lewis's River, a branch of the Shoshone." (Lea, 1838, p.78).



Traced from Lea,1838, Plate XX, Figure 64.

" Shell variable in form, irregularly obovate, ovate or rhomboid, generally rather strong, scarcely inflated, quite inequilateral;dorsal wing well produced, angular behind; dorsal slope excavately truncated, the truncation ending below in a generally upturned, rounded point at or about the median

(con.)

line; beaks low and compressed but pointed, their sculpture consisting of numerous, somewhat doubly looped ridges; surface irregularly concentrically striate, sometimes ridged; epidermis olive or brownish, often rough but occasionally shining; nacre bluish-white, occasionally tinted with lurid purple, rather dull, thicker in front. Length 87, height 62, diam. 27 mm. Length 87, height 55, diam. 27 mm" (Simpson, 1914, p. 379).

TYPE LOCALITY: Wahlamat (now spelled Willamette) River near its junction with the Columbia River, Oregon.

DISTRIBUTION: Washington; south to Kern County, California; east to Utah. (See Simpson, 1914, p. 380).

DISTRIBUTION IN CALIFORNIA: We have examined specimens from the following localities: Pools along Feather River, Sunset Ranch (5 miles NE of Live Oak), Butte Co.; Clear Lake, Lake Co. (A.G. Smith); Upper Spring Valley, San Mateo Co.; Antioch, Contra Costa Co., Dry Creek, Modesto, Stanislaus Co. (Chace); Soap Lake, San Benito Valley, San Benito Co. (Berry); irrigating ditch 1 mile east of Buttonwillow (20 miles west of Bakersfield), Kern Co. Large fossil specimens have been taken from the Buena Vista Lake region in Kern County.

" Quite variable in form, but generally having a high wing and an upturned rounded point or beak behind, above which the truncation of the posterior slope is decidedly incurved. The shell is usually larger and darker than either A. californiensis or nuttalliana. Certain specimens of this species gape at the anterior base." (Simpson, 1914, p. 380).

Anodonta dejecta Lewis, 1875.

Field and Forest, I (August and September), 1875, p.26

" Shell long, rhomboid or trapezoid, subinflated, strong, with a well-developed, rounded posterior ridge, inequilateral; beaks low, widely spread in the adult but rather flat, their sculpture consisting of irregular, concentric, corrugated folds, often extending well over the umbonal region; greatest diameter of the shell at or behind the middle; in front of the posterior ridge there is often a wide, shallow, radial depression, and viewed from above the front end of the shell is wedge-shaped; anterior end narrowed, sometimes drawn out a little but always rounded; dorsal wing low, subangular behind; posterior slope truncate; surface with irregular growth lines, which sometimes form ridges; epidermis pale olive-green or dirty brownish, sometimes banded and faintly rayed, somewhat shining; nacre dull whitish or bluish, usually lurid purple in the cavity; hinge sometimes thickened and showing faint vestiges of teeth. Length 85, height 48, diam. 27 mm.; length 84, height 44, diam. 27 mm. " (Simpson, 1914, p. 384)

TYPE LOCALITY: (of A. mearnsiana) San Bernardino Ranch, Mexican Boundary Line, Arizona.

DISTRIBUTION: Arizona; southeastern California; northwest Mexico." (Simpson). Fossil (Pleistocene) Le Conte Lake beds, California.

Dr. Dall (1896, p. 373) lists the following localities: San Bernardino Ranch, Mexican boundary, Arizona; Tuscon, Arizona; Colorado River, near the Mexican boundary; Santa Cruz River, near Tuscon, Arizona; San Bernardino River, Mexican boundary; New River at Laguna Station, Imperial Co., Calif.;

(con.)

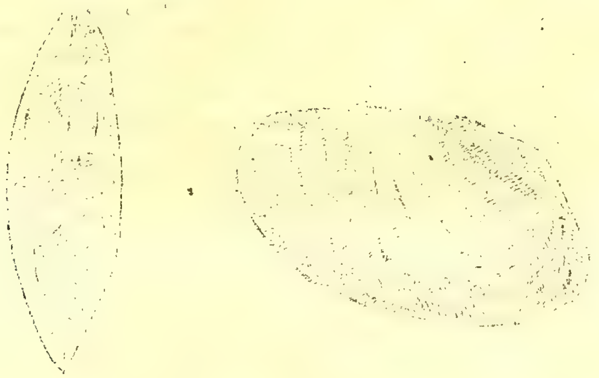
mouth of Colorado River.

" This species approaches A. californiensis on the one hand and forms of Gonidea angulata on the other. It is generally larger and always heavier than the former as wellas more rhomboid and brilliant. It never has the shar p posterior ridge of the latter, not its incipient teeth. I have examined many specimens of the animal, but have never seen one gravid." (Simpson, 1914,p.385).

Hannibal (June,1912, p. 128) makes this species the type ofa new genus Arnoldiana, based on " the developemtn, peculiar beak sculpture and an indescribable velvety texture of the shell." Simpson,Walker and others refuse to recognize the validity of Arnoldiana.

A. dejecta is figured by Dall (1896, pl.32, figs. 4,5) and by Hannibal (Jan. 1912, pl.1, fig.1; June-Sept.,1912, pl.6, fig.9). Anodonta mearnsiana Simpson,1893 is a synonym.

Hannibal's two figures, above referred to, suggest that Anodonta dejecta may be only a subspecies, or merely a form of Anodonta californiensis.



Traced from Dall,1896, pl.32, figs. 4,5.

In 1912 Harold Hannibal created a furor among taxonomists by his wholesale lumping of aquatic mollusca of the western North America with European and Asiatic forms. Among other things he considered A. kennerlyi and A.oregonensis synonyms of the Eurasian A. cygnea (Linne) and made A. beringiana a subspecies of A. cygnea. He called the more southern forms A. cygnea impura Say, with californiensis, nuttalliana and wahlamatensis as synonyms. Anodonta impura Say is an indefinite thing with lost types; and type locality, " Mexico". What it is no one knows. Hannibal's grouping and synonymy is definitely not acceptible. See Hannibal, June,1912, pp 124-126; see also Pilsbry, 1912, Nautilus 26 (6) :71.

Genus GONIDEA Conrad,1857

" Shell elongated, subtriangular, much narrowed in front, wide behind inflated, subsolid, with a high, sharp posterior ridge; beaks rather sharp but not high, the sculpture consisting of a few, strong, concentric bars; hinge with a rudimentary pseudocardinal and lateral in each valve, though these are sometimes wanting; dorsal scars forming a row within the shallow beak cavity; muscle scars irregular; pallial line with a trace of a sinus behind; nacre lurid to purplish.

" Animal having outer gills larger than the inner behind, narrower in

(con.)

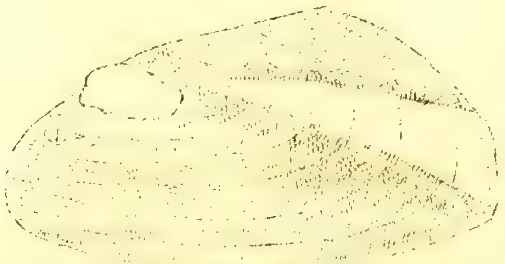
front, inner free from the abdominal sac, all united to the mantle nearly to their posterior points; mantle double edged; branchial opening large, a few irregular, large and small branched papillae on it; anal opening large, with rudimentary papillae; superanal opening closed a long way below; foot very large when living. No ova were found in the branchiae of numerous specimens taken at different dates and localities.

" TYPE: Anodonta randalli Trask and A. feninalis Gould" (Simpson,1914,p463)

Gonidea angulata (Lea),1838.

Tr. Am. Phil. Soc. VI, 1838, p.97, pl. XVI, fig. 52.

" Shell elongated, somewhat triangular, narrowed in front and wide behind, inequilateral, subsolid, generally inflated behind and tapering like a wedge to the anterior end, beaks only moderately full and elevated, their sculpture a few strong bars running nearly parallel with the growth lines, posterior ridge usually very high, often pinched up into a sharp carina and ending behind at the base of the shell in a point; posteriorend obliquely truncated; surface generally rude, uneven growth lines; epidermis yellowish-green to blackish, when light colored sometimes banded or clouded with green, occasionally feebly rayed; hinge having a rudimentary, compressed, smooth tooth in each valve in the region of the beaks and in young shells there are commonly vestiges of laterals; beak cavities shallow, with scattered dorsal scars; anterior muscle scars irregular, often separated; nacre luris purplish or purple brown, not irridescent. Length 93, height 44, diam. 35 mm. Length 93, height 48, diam. 30 mm. " (Simpson,1914, p. 463).



Traced from Henderson,1929, Page 60, Fig.9.

TYPE LOCALITY: Lewis' River

DISTRIBUTION: Southern California and north to British Columbia; east to Idaho. " Confined to streams flowing into the Pacific Ocean." (Hannibal, Ja .12, p.21).

DISTRIBUTION IN CALIFORNIA: Reported from " watersheds .... of the Sacramento and San Joaquin Rivers, the Santa Clara Valley, and the Valley of Los Angeles." (Dall, 1908, p. 499); Klamath River about one mile north of junction with Shasta River (T. Burch). Los Angeles River (Stearns and Hannibal). Pond 8 miles south of Ontario (Tremper). Ballona Creek " near end of West Adams Street, Los Angeles (Chace). Typical specimens with very prominent posterior ridge were taken in Dry Creek at Modesto, Stanislaus Co. (Chace).

ECOLOGY: " In his communication, Mr. Hannibal gives the following interesting data as to the habits of the species in his locality; It is found in " sloping clay banks, between four inches and two feet below the water level .

(con.)

They dig close to the surface a horizontal burrow, perhaps three times their length or less, with a sloping ditch down the slope (ofthe bank), which they stay in when the water level falls in summer. They are sometimes solitary, but usually there are two or three very large ones and several smaller ones in the same burrow, where they brace themselves very tightly. A twenty-five-yard-long clay bank will often yield forty or fifty big fellows for dissection work. One exception to this situs was found in an artificial pond with brick walls, and bottom, and inhabited by ducks. Here scattered big fellows might be found all over the bottom, where they had been washed in at a time of high water, and later were unable to get out. It may be added that Mr. Henry Hemphill found the strongly angulated form of this species inbedded to the level of the angle or carina, in rapid streams, so that the material carried along by the current would slip easily over the flattened surface of the end of the valves without disturbing the animal or eroding the shell." (Dall,1908, p. 500).

Specimens with somewhat less angular dorsal ridges than in typical were taken by T. Burch from the Klamath River about one mile north of its junction with the Shasta River on " muddy bottom in shallow water, two to three feet d deep."

There is considerable variation in the prominence of the dorsal ridge (angulation). Shells in which the dorsal ridge was very faint or almost totally absent have received various names as var. *subangulata* (Hemphill) and var. *haroldiana* Dall. Some hold that this variation is of no genetic significance but purely an ecologic form, the heavily angulated forms occuring in rapid streams while the forms with less pronounced angulation are found in streams with a sluggish current. The faintly angulated form has the same geographical distribution as the typical form.

" An exceedingsly variable and apparently abherrent form. In most specimens the posterior ridge is the most striking character,being high, sharp and often pinched up. Occasionally it is lower and somewhat double and rarely it is scarcely developed at all. Sometimes this species livess in rapidly running water, the anterior part buried in the hard bottom as far as the posterior ridge,which runs on a level with the surface of the bottom,the posterior end points down stream. It is probable that specimens living in such environment have a strong, high posterior ridge and that those found in comparatively still water have it much less developed. I have a photograph sent by Mr. Henry Hemphill of a shell in which the posterior ridge is almost wanting and such specimens are usually thinner than those with the high ridge, an evidence of living in stiller water." (Simpson, 1914, p. 465).

Lee lists as synonyms A. feminalis Goula and A. randalli Trask (1856,p.81)

Gonidea angulata subangulata (Hemphill),1891.

Z Zoo, I, 1891, p. 325, pl.X, figs. 1-2.

" In general outline this form recalls at once its nearest relative, *A. angulata* Lea. Compared with that species, it is more oval in outline; the ridge or angle radiating from the umbones to the anterior (posterior) ventral margin of the shell is nearly or quite obsolete in the specimens before me; the anterior margin of the shell is more produced on its dorsal edge, while its ventral edge is more rounded at the point where the angle terminates, and the intervening space between the angle and the front margin of the shell is less concave in form. The shell is also less pointed and more rounded in its posterior outline,and is much less inflated in general form. In color and lines of growththe two shells agree fairly well. Length 3.5, height 1.35, diam. 7/8 in (Hemphill) . " It will be noticed as indicated above, that the author is prepar-

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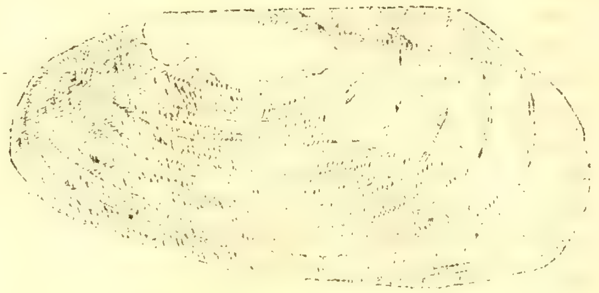
-ing his description miscalled the anterior and posterior ends of the shell." (Simpson,1914, p. 465).



Traced from Henderson, 1929, p. 61, fig. 10

TYPE LOCALITY: " Russian River, Putah Creek and Upper San Joaquin River, California." (Hemphill).

DISTRIBUTION: Same as typical G. angulata.

" Anthony's subangulata was described as an " Anodon" and not as an Anodonta, and, therefore does not prevent the retention of Hemphill's name." (Simpson).

Dall's variety haroldiana was described in 1908, hence it becomes a synonym. Type locality of haroldiana, Coyote Creek between San Jose and San Francisco Bay. (see Hannibal, Jan. 1912, p.21.)

Specimens from a pond eight miles south of Ontario have a smooth dark yellow-green epidermis and are much thinner than typical specimens. They are somewhat variable. On one specimen the posterior ridge is fully as prominent as on typical specimens from the Klamath River. Specimens of this lot were identified as haroldiana by Dr. Dall. I suspect that the specimens submitted to him were selected specimens which did not trully represent the local form.

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Notes on Collectors and Affairs

Dr. John Oughton, Ontario Agricultural College, Guelph, Canada. This is a new address and a new assignment. He writes that he was engaged last summer in a fisheries survey at Great Slave Lake. " Our laboratory barge was based in the eastend of the lake where we samples the very deep water (100-2000 ft.)"

That is a lot of water even in the open sea and I am really impressed when you considerthat this is inland. I trust we will learn what they found.

Dr. Wm. J. Clench, Museum of Comparative Zool., Harvard University. " ... Keep up the grand work. Hope to have another Johnsonia out in 6 weeks."

Robert R. Talmadge, 1736 L. St., Eureka, Calif. Has evidently been collecting some very interesting land shells. " I also wishto thankyou for publishing my letter to you in the Minutes, as Dr. Berry has generously helped me, and in return I have beena ble to furnish him a few specimens. I also heard from Mr. Chace who had collected extensively from the Monadenia colonies in this area. However, I find that I actually have stumbled onto a new subspecies that is remarkkbly different. Dr. Berry who has a small series of the specimens agrees with me. The other form I wrote about is a distinct hybrid that is fairly common here, but not distinct enough nor uniform enough in characteristics to be called anything else than a form or phase."

Mr. Walter J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. A few excerpts from Mr. Eyerdams letters received in the past few months will be of interest. He spent the summer at Port Vita, Raspberry Island, Alaska. " ...There had been a heavy snow during the winter which melted quickly when the nice weather set in. The result of a heavy run off of water into the sea caused a vast amount of Mr. Katmai ash of the 1912 eruption to be carried down to the sea-beaches. This ash is nearly as white as snow. Although not of any permanent damage to littoral marine life, still large quantities of the ash was sufficient to make some stretches of the beach almost sterile for any but the most hardy of marine invertebrates. By next summer conditions should be right again after heavy winter storms have redistributed the ash again. The herring nets sometimes dragged bottom so often there were a few large shells mixed with the herring. These were Fusitriton oregonense Redfield, Beringius crebricostatus Dall, Beringius kennecottii Dall, Neptunea pribiloffensis and liratus and one or two others." Eyerdam travelled by plane between Kodiak and Seattle and some of his observations are of real interest. " Flying over the Kenai peninsula seemed especially intriguing from a biological standpoint. There are innumerable small round lakes and ponds in one large area. Meandering streams with numerous oxbows and oxbow cut offs which apparently have caused the round lakes and ponds in bygone years of other meandering streams are everywhere on the flat landscape. Many and varied shades of patches of mosses and other plants indicate a region of great interest to a botanical explorer if he can stand the mosquitoes and gnats.". Eyerdam comments on Dr. Bartsch's work on " Annulariidae of Hispaniola and the Bahama Islands". In this work Dr. Bartsch worked up a collection made by Eyerdam in 1927 in the S.W. peninsula of Haiti. " He has described four new genera that I discovered including Eyerdamia and a dozen new species."

Ralph and Ann Bormann, 3828 3rd Ave., San Diego, Calif. announce the arrival of Robert Owen Bormann, Jan. 29,1947- Wt. 7 lbs., 13½ oz. A little young now but we assume we have another member.

Edward C. Jaeger, Box 704, Oceanside, Calif. Some of the readers have a few of the interesting things collected by Mr. Jaeger on Okinawa. We are happy to have him with us now in southern California. He is heading for Mexico now.

Ruth E. Eaton, 3333 Orange St., Riverside, Calif. This is the new address, but Miss Eaton is really getting around. We heard she attended the shell show in St. Petersburg, Florida.

Rodolphe Verhaeghe, 84 Rue de l'Eglise, Berchem Ste. Agathe, Bruxelles,Belgium I regret that through inadvertance in a recent issue I added Netherlands to this address when, of course, it is Belgium. Incidentally you will find him an excellent exchange correspondent who sends out well prepared material.
Mrs. E.W. Boerstler, P.O. Box 494, Corona del Mar, Calif. We regret to learn that Mrs. Boerstler has not been well recently.

Minutes of the Conchological Club of Southern California-Feb. meeting

The Conchological Club of Southern California met at the usual time and place Feb. 4,1947. Called to order by the president. There were 18 members present and 2 who expressed a wish to become members and were duly elected. They were Carolyn Halde, 1017 Tiverton, Los Angeles and Paul H. Steele, 3487 Barhite St., Pasadena 8, Calif. There were also two visitors : Mrs. W.L. Lloyd of San Pedro and Dr. F.M. MacFarland, 775 Santa Ynez, Stanford University, Calif. Dr. Wm. L. Lloyd was with us for the first time, though he has been a member for some time. We are hoping he and Mrs. Lloyd will make attendance at the club a habit. Several new publications were listed and discussed. The recent death of Thos. Wm. Crowhurst was reported. While not a club member he was always greatly interested in our work and has sent many, the secretary among them to our meetings who later became members. He was a real worker among us. The scheduled talk for the meeting was given by Dr. W.O. Gregg and the subject was " Collecting in the Desert Regions of California". While most of us have not had either the opportunity or the fortitude to negotiate the hard trails that must be travelled to get anywhere in this arduous quest, we all can, at least, sit on the side lines and appreciate what " the few" have done. Dr. Gregg had plenty of maps of the regions and a man-sized load of beautifully mounted specimens to show that he had been places on the snail hunt. Mr. and Mrs. E.P. Chace and Morris Caruthers added their share to the tales of long and very up hill journeys. The rest of us just sat to listen admiringly while several of our hardier members made signs to indicate a " me -too" state of mind. We stayed very late but did finally adjourn.

Effie M. Clark, Secretary- Treasurer.

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Minutes of the Long Beach Shell Club- Feb. 9,1947. Items condensed by editor . Miss Eaton resigned as secretary to leave for Florida for 5 months. Ralph Bormann elected to fill he place. Miss Coley of Fanwood, N.J. was a visitor as well as a number of girl scouts. A scarcity of shells at Pt. Vicente was reported by E.W. Ulrich. Mrs. E.P. Chace reported the collectingas poor also at White's Pt. and Inspiration Pt. At Lunada Bay she reported Haliotis fulgens. Mrs. Coley said that many shells that come ashore at Sanibel Island,Fla. seem to be diseased and that something had been killing the shell life. Miss Rex reported that large amounts of Chione have been being taken from Alamitos Bay which is against the fish and game law. Mr. Chace, the club president said he would notify the authorities. The program was by Mrs. Mary Bormann on " Some West Coast Ocenebras". The March meeting will be devoted to a round table discussionto help beginners.

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W.J. Bower, 340 Third St., S., St. Petersburg,5,Fla. The reports of the shell show in St. Petersburg should inspire us to try a similar thing on this coast. " Our Shell Show ended last night, as a big success. We had 5,000 paid admissions and many of those attending showed great interest and expressed admiration. One lady said she would be willing to pay all expense of transportation if it could be put on in Detroit, Mich. It really was fine and there were thousands of lovely and rare shells. A rough census was about 10,000 shells

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and 5,000 species. One of our members had a showcase with 536 cones, 240 species. My only exhibit was a growth study of six common shells, from the egg cases to the adult and I was surprised at how much interest was shown, especially by those who knew nothing much about shells. "

Your editor sent Mr. Bower a set of Tegula regina (Stearns) and is pleased with the success of Mr. Bower as an exhibitor since he received a blue ribbon on them.

Dr. Chester C. Wright, Instructor, Biological Sciences, Sacramento College, Sacramento 14, Calif. Dr. Wright's research work for his doctors degree at Stanford was on the reproduction and cystology of Ariolimax californicus. Dr. Gregg and our other slug experts whould arrange a session with Dr. Wright.

Dwight Taylor, The Webb School of California, Claremont, Calif. sent in some fresh water material which is welcome at this time when Dr. Gregg is working up our fresh water reports. He also mentions that he has turned up the following: Helix aspersa, Helminthoglypta tudiculata angelena, H. t. imperforata, (somewhat scarce), H. petricola zechae, Deioceras agreste, Limax marginatus, Milax gagates. In addition to these there are several small snails as yet to be determined. However, this sounds like a fine start.

Miss Grace Jean Cornell, 1417 Fernwood Rd., Victoria, B.C., Canada. We are pleased to welcome Miss Cornell to our group.

Dr. E. LeLoup, Musee Royal de Belgique, Brusseles, Belgium. Since we have been recently studying Dr. LeLoup's work on the chitons the following news item may be of interest " ... Now, he is in the Belgian Congo (Africa) where he studies the conchological fauna of the big lakes."

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Those wishing to register their interests in the new directory of conchologists will please send in their data from the following list or add special interests.

1. World Wide Sea Shells
2. Pacific Coast Shells
3. Marine Shells
4. Land Shells
5. Fresh Water Shells
6. Buy Shells
7. Sell Shells
8. Exchange Shells
9. Buy Books.
10. Field Collecting
11. Marine Life in General
12. Fossil Shells.

The directory will be international and will be published this spring. Price $1.50.

The host of new names that are pouring in is amazing. It is obvious that the returned veterans who started collecting during the war are many of them carrying on with their interest.

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Tegula regina (Stearns)- The Marine Museum at Scripps Institute of Oceanography, La Jolla have living specimens of this very rare mollusk in the Scripps Aquarium. There is little doubt but that this is the first time this species has been studied in this manner. No doubt a great deal will be learned of its habits. It is assumed that it is a vegetarian living on broad leaved kelp.

Dr. A. Myra Keen, Box 1563, Stanford University, Calif.

" I have just noticed that Bivonia Gray is a homonym of Bivonia Cocco,1832, a crustacean genus. The first available synonym seems to be Dofania Morch,1860 (Jour. Conchyl., vol.8, p. 34. Type (by absolute tautonymy): Serpula goreensis Gmelin (Le Dófan Adanson).

As I had not hitherto taken time to familiarize myself with the classification of this group, I felt I must look over our material critically before mentioning to you the above necessary change in nomenclature. I hoped that perhaps it would be possible to lump all our worm shells into one broad genus, such as Vermicularia , but this does not seem warranted. It is unfortunate that most of the separations have to be made on the basis of the operculum, which usually is missing in the specimens collectors obtain. In Dofania the operculum is small or rudimentary, whereas in Aletes,Spiroglyphus, and other genera it is well developed,even at times spinose.

I find one or two distribution records in the Vermiculariidae that must be corrected: The Oldroyds record of Aletes squamigerous pennatus (Morch) in Puget Sound is based on a misidentification, the specimens in their collection so labelled being the polychaetous annelid worm, Serpula vermicularis Linn. However, they do have what appear to be authentic specimens from San Pedro, living."

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The above study by Dr. Keen has the result of changing the name of # 1456 in my Check List, and it is suggested that those using the list change it to read Dofania compacta (Carpenter),1864.

************* John Q. Burch

New Publications

" A Monograph of the West Atlantic Mollusks of the Family Aclididae" by Dr. Paul Bartsch, Smithsonian Miscellaneous Collections, Vol.106, No.20 29 pp, 6 pages of plates.

This is a very interesting paper in which Dr. Bartsch describes a number of new genera which may very well involve some of our west coast species. Of course, in the first place the use of the family Aclididae is new usage to us. We have treated Aclis Loven,1846 as a genus of the family Eulimidae (Melanellidae). In addition to this we have two of our species A. shepardiana and A. californica under Graphis Jeffreys which we used as a subgenus of Aclis Loven. Dr. Bartsch gives Graphis generic value which would change our labels from Aclis to Graphis on the two species mentioned above. However, until some student covers our species as carefully perhaps we had as well wait. Perhaps our species will turn up with a generic name of their own.

Mollusca- Mr. Reed is now publishing a Glossary of terms used in the description of mollusks. The work is of great value and if you are not receiving this work now you should not delay in sending $2.00 to Paul H. Reed, Box 267, Tavares, Florida. The value of the material in book form would cost you a great deal more not to mention the other items of general conchological interest.

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Mr. T. Pain and Mrs. Marjorie M. Pain, 71 Gower St.,London W.C.1,England

Mr. Pain's special interest is the genus Ampullaria, at this time working on the African species. Mrs. Pain in the minute land shells of Norfolk and Lord Howe's Islands in the Pacific. Both will exchange.

ADVERTISING

Many periodicals with a much smaller circulation than our Minutes accept some advertising. We have decided to offer space on the back pages of our paper if anyone wishes to take advantage of it. Full page $8.00, half page $4.00, quarter page $2.00 per issue.

The quality of our art work is not recommended. However, it is a simple matter to trace any pen and ink drawing on a stencil. There will be no additional charge.

Small notices on these pages may be inserted for 4¢ per word.

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Those interested may obtain some of the species of fresh water pelecypods discussed in this issue from John Q. Burch,4206 Halldale, Los Angeles 37.

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Tide Tables- Pacific Ocean and Indian Ocean- U.D. Department of Commerce, Coast and Geodetic Survey- Serial No. 681.

Of course, all local members of the club are more than welcome to use my copy, and perhaps I should not mention this because I am always glad to have them call. However, the above book 405 pages of it gives the tide for every locality on this coast from Cape Horn to the Arctic and is about the biggest bargain I can immagine for a shell collector for a mere two bits- 25¢. There is a similar publication for the Atlantic but I do not have the serial number of it.

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The first portion of our compilation, " The Fresh Water Mollusca of California" appears in this number of the " Minutes". Any comments, discussions, additions, or corrections will be sincerely appreciated and will aid in this work. It is proposed to continue the compilation of data on this group and from time to time additions and corrections will appear in the form of supplements.-- Wendell O. Gregg, 2200 S. Harvard Blvd., Los Angeles 7, Calif.

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The Pacific Shell Club meets on the third Sunday of every month at 2:30 P.M. at the Los Angeles Museum in Exposition Park, Los Angeles, Calif.

This organization of young collectors under the guidance of Dr. H.R. Hill, Curator of Mollusks at the museum, has been doing some very fine work and Dr. Hill should be congratulated indeed. The attendance so far exceeds our own that it is almost embarassing.

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J.L. Staid,123 Rue Clovis, Rheims, Marne, France. Many of us have exchanged with Mr. Staid over a period of years and while we have never met him face to face we feel as if he is an old and valued friend. We are happy to have a nice long letter from him advising that he is physically well and again wishes to resume his shell exchanging. He writes " I have just completed the revision of the Nassidae(*Nassarius*, also *Bullia* or *Dorsanum*) and could offer over 100 Recent sp. of that family. I have also some splendid material in Eocene fossils (well preserved and carefully named) namely from the Paleocene ...." He writes at length of high prices and the difficulties that seem to afflict us as well.

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
April 1947

Subscription $2.50 per year.

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, Calif. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calig.

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The annual meeting of the American Malacological Union is to be held at Pacific Grove, California, June 18 to 21. It is assumed that all members will wish to attend the meeting. Please write Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. for your hotel reservations.

It is suggested that any of our members who are not members of the A.M.U. may make application by writing the national secretary Mrs. Harold R. Robertson, 136 Buffum St., Buffalo 10, N.Y., or you may send your request to the editor who will be glad to forward it. The dues are but $1.00 per year.

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New Publications Received

The Nautilus, Vol. 60, No.3, Jan., 1947. There are several interesting papers in this issue dealing with the fauna of this coast.
" A New Pyrgulopsis From Oregon" (P. archimedis) by Dr. S.S. Berry
" Color Variation in Olivella Undatella" By D.S. and E.W. Gifford
" Our West Coast Marine Fauna" by A. Sorensen
" A New Subspecies of Monadenia From Northern California" by Robert R. Talmadge

There is a biographical paper on the life of the late Dr. B.R. Bales. Dr. J.P.E. Morrison under Notes and News announced the name Zetekina to replace Zetekella Morrisson, 1946.

" Eastern Pacific Expeditions of the New York Zoological Society, XXXV. Mollusks from the West Coast of Mexico and Central America. Part IV." by Leo George Hertlein and A.M. Strong. Reprinted from Zoologica, Vol.31, Part 3, Dec.5, 1946.

Many of our Californian species are discussed in this interesting paper which should certainly be immediately added to every west coast library. A few of the items of interest to us follow: The authors recognize Cyathodonta dubiosa Dall with the range San Pedro, Calif. to Champerico, Guatemala considering it distinct from C. undulata Conrad. In our work we thought the two synonymous which placed dubiosa in the synonymy of undulata. And in any event the range extends northward to at least Monterey, California. In this issue of this paper will be seen a correction of a few northern records of Thracia curta Conrad. The authors here have accepted the published range giving the northern limit as Icy Cape, Alaska. The late George Willett questioned the northern records of this species and it would be of interest to know whether these northern specimens have been examined. The authors here consider Entodesma a subgenus of Lyonsia. We have been giving Entodesma generic standing. The authors use the genus Poromya which we oabandoned

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to give *Dermatomya* generic value. The authors here consider *Cardiomya* a subgenus of *Cuspidaria* . We thought that the sculpture or lack of it was sufficient to constitute a generic division. The record of *Thyasira excavata* from the Gulf of California is interesting. There areapparently no records between Tillamook, Oregon and the Gulf. The authors here on the other hand give generic value to *Anodontia* Link which we very probably were incorrect in placing as a subgenus. We questioned the San Clemente record but there seems to be no sound reason to challenge this in the light of the new records here given.

" The Genera Purpura and Thais in the Western Atlantic" by William J. Clench, Johnsonia, Vol.2, No. 23, March 10,1947.

Questions raised in this fine paper bearing on the nomenclature of our west coast species must be reviewed at a later date.

" Nutrition, growth and sexuality of the Pismo clam (Tivela stultorum)." by Wesley R. Coe, J. Exp. Zool. v. 104, no.1, February,1947. This very thorough paper is a study of many of the problems we have occasionally considered.

" Northern Pelecypods in the Collection of Tromsø Museum" I. Families Pholadomyidae, Thraciidae, and Periplomatidae. By T. Soot-Ryen. 41 pages, 10 plates . 1941. This work is in English and is very carefully worked out with very unusually excellent photographic plates illustratiog the shell, shell sculpture, and the hinges. This work will be of great interest because of the number of northern pelecypods that are thought to be circumboreal. There is no doubt but that this work will be cited often. It should be added to all libraries.

" The Paleontology of the Pleistocene Molluscan Fauna of the Newport Bay Area, California" by Stephen C. Bruff, Univ. of Calif. Press, 1946. pp. 213--240, 12 text figures. This work is of particular interest because a number of our members are studying additional localities and material in this district.

" Bulletin De La Societe Les Naturalistes Belges" Bruxelles, Belgium- Jan-Feb. 1947. This issue contains (in French) a paper on the molluscan fauna of the La Panne district by R. Verhaeghe.

Basteria" . This is the organ of the malacological society of the Netherlands Nederlandsche Malacologische Vereeniging'. It is a well edited work with excellent plates. There is an occasional paper in English. A review of the articles other than those that might pertain to the fauna of this coast will not be advisable.

We also received a file of well mimeographed papers " Correspondentieblad van de Nederlandsche Malacologische Vereeniging".

Zoological Record, edited by A.E. Salisbury- Printed for the Zoological Society of London. The part dealing with Mollusca covering the year 1944, priced at 8 shillings has been received, and is of course, invaluable for purposes of checking up on publications of interest and overlooked. It is international and attempts to be complete.

A number of publications have been received from Dr. Hans Schlesch. These were published during the war and have probably not had the distribution they merit. " Die Land-Und Susswassermollusken Lettlands " Sonderabdruck aus dem,,Korrespondenzblatt des Naturforscher-Vereins zu Riga LXIV Seite 246-360. This is a work giving the distribution of species in great detail.

The following paper is a continuation of the work of Allyn G. Smith on the chitons.

CLASS AMPHINEURA

ORDER POLYPLACOPHORA

Superfamily MESOPLACOPHORA

Family *Ischnochitonidae*

" Valves external, having sharp, slit, insertion plates, the teeth not buttressed. Eaves solid...; girdle covered with imbricating scales, either flat or convex, smooth or striated. Gills typically extending the entire length of the foot, but in some species theyare short in front or at both ends." (Pilsbry, Manual, 15:53).

Surface of the intermediate valves are divided into lateral and central areas by a diagonal, which is often indistinct, but which extends from the beak to the outer front angle of the tegmentum. If this is not clearly the case, the tail valve has an even crescentic series of well developed teeth. In the *Ischnochitonidae* the teeth are never closely and finely pectinated. The valves lack eyes.

According to Pilsbry, *Ischnochiton* is the typical or central point in the development of the sharp-toothed division of Chitons, around which the other genera naturally group themselves. The great diversity of the girdle characters permits the use of them as a basis for division into subgenera and, if desired, into sections.

The classification of the *Ischnochitonidae* used here generally follows that used by Berry (1922), who divides the family into three subfamilies- *Chaetopleurinae*, *Ischnochitoninae*, and *Callistochitoninae*. Thiele (1929) recognizes only the first two of those families [illegible]

Subfamily *Chaetopleurinae*

Upper surface of the valves generally set with pustules, which are arranged in radial rows or in no regular order on the tail valve and the lateral areas (of the intermediate valves), and in parallel rows on the central areas. Upper part of the girdle with small, generally scale-like shelly spines and with sometimes larger and sometimes smaller needle-like spines with more or less long, basal doubled pores (Doppelbechern). Side plates of the radula with three or two-cusped rachidian teeth. (Trans. from Thiele, 1929, part 1, page 15).

Genus *Chaetopleura* Shuttleworth,1853

" The valves are solid, porcellanous within, having rather long sharp teeth and squared sinus. Externally theyare sculptured with longitudinal beaded riblets on the central areas, and pustules or pustulose ribs on the lateral areas. Mucro in front of the middle. Girdle having corneous hairs, sometimes rising from a dense mass of chaffy scales." (Pilsbry, Manual, 15:70).

Type, by subsequent designation (Dall,1879, p.296), *Chiton peruvianus* Lamarck/

1. Chaetopleura beanii (Carpenter,1857).
Range: Unalaska, Alaska, to Mazatlan,Mexico (Dall,1921). Type locality,Mazatlan
Remarks: This is a little known species, which has not been figured.
Collecting Records: Does not appear in any of the material examined, or in any recent published records so far as known.

2. Chaetopleura gemma Dall,1879.
Range: Straits of Georgia, B.C. (Berry,1922), to Magdalena Bay, L.C. (Dall, 1921). Type locality, Monterey, California.
Remarks: Our commonest Californian Chaetopleura, characterized by the elongated cylindrical pustules that decorate the lateral areas of the intermediate valves and the head valve. The color is variable, southern California specimens and those from the Mendocino County coast being of a dingy brown or gray, while the most frequent color of specimens found at Monterey is a bright terra-cotta red, often with the end valves black, or with black dots on the intermediate valves along the jugal ridge. An occasional orange-yellow specimen is found with black markings as in the red colored form. Found at low tide, under rocks, down to 15 fathoms.

The original spelling, " gemma", a jewel(see Dall,1879, p. 296), should be used instead of the emended version " gemmea", which has found its way into the literature.

Collecting Records: Straits of Georgia, B.C., W.F. Thompson, coll. (Berry,1922 p. 461). California:- Mendocino Co.- Fort Bragg(Hemphill, coll. (CAS,AG Smith)); Little River (AGS); Anchor Bay (AGS);near Gulala (AGS)- Sonoma Co.- near Jenner (AGS). Marin Co.:- Pt. Reyes (AGS). San Mateo Co.: Moss Beach (AGS). Monterey Co.:-Monterey, Pacific Grove, Carmel etc. low tide to 15 fms.(Berry, Burch,Chace , Smith, Willett). San Luis Obispo Co.:- San Simeon (Burch);near Cayucos (AGS); Los Angeles Co.:- White's Pt. (AGS);San Pedro (Willett).San Diego Co.:-off San Diego (Gripp,Nautilus, 22:136). Lower Calif:-San Geronimo Id., Todos Santos Bay (Willett); Santo Tomas (Hemphill coll (CAS); Arbolitos, 10 mi. S. of Punta Banda (Burch).

3. Chaetopleura lactica Dall,1919.
Rangeand Type Locality: Catalina Harbor (Dall).
Remarks: Certainly known only from the type lot.
Collecting Records: Listed by Willett from the Los Coronados Islands,Mexico. His specimens have not been examined.

4. Chaetopleura parallela (Carpenter),1864
Range: San Diego, California to Cape San Lucas, L.C. and West Columbia, S.A. (Dall,1921). Type locality, Cape San Lucas, Lower California.
Remarks: In the Manual of Conchology, Pilsbry (14:33,34) cites both C. parallela and C. prasinata, along with C. columbiensis Sowerby, as varieties of C. lurida Sowerby. A large series of lurida collected at Panama and preserved in alcohol shows considerable minor variation in sculpture and wide variation in color. Nothing like these specimens have been seen from north of San Diego, so the San Diego and any other records from California would appear to be in need of confirmation before either parallela or prasinata are admitted to the list. The style of sculpture of C. parallela is said to be the same as in C. gemma, but the shell of the former species is much broader.
Collecting Records: None recently, so far as known.

5. Chaetopleura prasinata (Carpenter,1864).
Range: San Diego,Calif. to Cape San Lucas, L.C. (Dall,1921).Type Loc. Cape San Lucas.

Remarks: See remarks under the preceding species.
Collecting Records: In the Burch Collection is a series of 7 specimens of a species of Chaetopleura, dredged in from 35 to 60 fathoms off southern Calif. that are labelled prasinata but are provisionally assigned to this species only with considerable doubt. All specimens are small (3-7 mm.), the smallest ones being undoubtedly juvenile. They are nondescript in their dark coloration but the principal feature consists of the sutural tufts of sharp-pointed spines from 3 to 6 in number, some of them quite long for the size of the shell. These are in addition to other, shorter spined or spicules that are scattered generally over the girdle. Localities of the Burch specimens areas follows: off El Segundo shale, 35 fms.; off Redondo, 60 fms.; off Bluff Cove, 50 fms.; off Santa Cruz Island, 50 fms. Willett reported to have taken C. prasinata from the following localities, Catalina Island, 30 fms.; Coronado Ids.,Mex. 15 fms.. As his specimens have not been examined, it is not known whether they belong to the same species collected by Burch but this seems likely.

Subgenus Pallochiton Dall,1882.

" Valves exposed, solid, the anterior and median having sharp insertion teeth slightly roughened outside; slits of the anterior valve not corresponding to anything in the external sculpture; tail valve having the mucro at the posterior end, the teeth sharp and all strongly directed forward; eaves solid; sinus notched at sides. Girdle leathery, with a few decidous hairs, but no pores" (Pilsbry, Manual, 14:256).
Type, by monotypy (Pilsbry,1893, Manual, 14 :256,7), Pallochiton languinosus Pilsbry,1893.

" This genus closely resembles in sculpture as well as structural characters Chaetopleura Shuttlew.: differing only in the posterior position of the mucro and the consequent throwing forward of the tail valve insertion-teeth,-characters of no great importance. The slits correspond in position to nothing in the external sculpture. The girdle is decidedly like Chaetopleura, being very sparsely hairy (or smooth) and lacking appearance of pores." (Pils.,Man. 14:257).

6. Chaetopleura languinosus (Pilsbry),1893
Range: San Diego, Calif. to Magdalena Bay, L.C. Type Loc. Todos Santos Bay,L.C.
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Remarks: " The posterior terminal mucro, leathery girdle, and beaded sculpture well distinguish this species. The coloring of some specimens (such as those from S. Ignacio Lagoon, Lower California,....) is of exquisite delicacy. Old individuals generally lose the pustules of the surface except at the base of the valves....
" A peculiarity of coloring not mentioned in the description is the vertical white stripe extending down the posterior slope from the mucro of the tail valve. In the great number of individuals examined by me I have never found this lacking." (Pilsbry, Manual, 14:258).
Collecting Records: None recently reported from north of the Mexican line (Lower California). Lower Californian records are as follows: Todos Santos Bay (Willett); rubble reef, Punta Banda, Todos Santos Bay (Burch); San Quentin Bay, Connelly coll. (Burch); San Ignacio Lagoon, Hemphill Coll.(CAS); Pt. Abreojos, Hemphill coll. (CAS); Magdalena Bay, Orcutt coll. (CAS).
In the collection of the California Academy of Sciences is a lot of 5 specimens, No. 4002, with the following label in Hemphill's handwriting:"Original lot, Cpr. Todos Santos Bay, Lower Calif. (narrow). Coll. by H.H."

Subfamily- ISCHNOCHITONINAE

Shell with heterogeneous sculpture, sometimes long and narrow, but mostly of the usual shape, teeth of the insertion plates not pectinated as a rule although this may be more or less suggested. Upper part of the girdle generally decorated with fairly large, closely-set, frequently striated scales, while spicules set in doubled pores are limited entirely to a row around the girdle edge. (Trans. from Thiele,1929, pt.1, p. 16).

Genus ISCHNOCHITON GRAY,1847

" Valves external, having sharp, slit, insertion plates, the teeth not buttressed. Eaves solid...; girdle covered with imbricating scales, either flat or convex, smooth or striated. Gills typically extending the entire length of the foot, but in some species they are short in front or at both ends." (Pilsbry, Manual, 14:53).

Type, by subsequent designation (Dall,1879, p. 296), Chiton longicymba Quoy & Gaimard,1834.

Subgenus Stenoplax Dall,1879.

" Elongated, narrow Ischnoids, having the girdle covered with minute crowded, imbricating striated scales. Median valves having the lateral areas much raised; posterior valve large, depressed, the mucro subcentral or slightly posterior." (Pilsbry, Manual, 14:56).

Type, by subsequent designation (Pilsbry, Manual, 14:56), Ischnochiton limaciformis Sowerby,1832.

Stenoplax divides naturally into two sections: (1). Section Stenoplax s.s. in which the median valves have a single slit on each side, and (2) Section Stenoradsia, the species of which have two or several slits in the median valves, according to Pilsbry. Berry uses Stenoplax in a generic sense, with Stenoradsia as a subgenus. Thiele treats Stenoplax as a subgenus, with several sections, but Stenoradsia appears as a section of the subgenus Ischnochiton in his arrangement, which appears to be an incorrect assignment in view of the extremely close relationship between the two groups.

1. Ischnochiton biarcuatus Dall,1903.
Range: Santa Barbara to San Diego, California (Dall,1921). Type locality, 40-60 fathoms off Catalina Island (Lowe).
Remarks: The type specimen (dry) measures 18 mm. by 7 mm. The sculpture of the central areas of the intermediate valves consists of " two sets of arcuate radiations crossing each other obliquely and with the inter-reticulations impressed or punctate, so that an irregularly zigpzag effect is produced..." This ought to be ample to identify this species. The single slitting of the intermediate valves places it in the section Stenoplax s.s. No specimens have been available for study. The species must be rare as Burch did not dredge it in his collecting off southern California.
Collecting Records: None except the original lot known.

2. Ischnochiton conspicuus Pilsbry,1892.
Range: Santa Barbara, California, to Magdalena Bay, Lower Calif.; between tides. Also Pleistocene at San Pedro, Santa Monica, Long Beach, and San Diego (Berry,1922). Type locality, San Diego, Calif. (Oldroyd).
Remarks: This species belongs to the section Stenoradsia, Carpenter,1878. It may be separated from I. magdalensis Hinds and I heathiana Berry by the girdle, which is not scaly but " densely beset with short bristles, giving

it a velvety aspect". Not mentioned in the original description, but shown by Pilsbry (Manual, 14, pl.15, fig.94), are the fine striations of the bristles that are clearly seen under magnifications of x14 and higher. Very young specimens of conspicuus are separated only with difficulty from similar sized specimens of magdalensis and heatheana. The interior of the valves is often tinted with brilliant color, usually a deep pink but sometimes blue-green. Often there is a narrow blue-green band of color at the sinuses of the valves. It is a very large, fairly common species, well named.

The normal habitat of this Ischnochiton is the undersides of smooth rocks buried in sand or gravel; another is between slabs of shale or rock in deep where the wash of the waves does not reach. E.P. Chace (Nautilus, 31:37-40) gives an interesting account of the variation in conspicuus and comments particularly on the differences in the shape and texture of the valves of individuals that live in the exposed lower end of holes long since vacated by the rock borer Parapholas californica. He calls attention to the name given this variant- " var. solidus" - by Pilsbry (Manual, 14:64) and concludes it is merely a situs form, a viewpoint that seems to be correct. Another variant, a 6-valved specimen collected by Hemphill, is reported by Stearns (Nautilus, 15:53). While 7-valved specimens of chitons have been found occasionally, one with only six normal valves would be an extreme rarity.

Ischnochiton conspicuus is of special interest because of the three species of gastropods and one pelecypod that are occasionally found living commensally with it, usually under the edge of the mantle. Teinostoma invallata Carpenter, T. supravallata Carpenter, and Vitrinella oldroydi Bartsch have been found in such association, as also has the minute bivalve Serridens oblonga Carpenter, the first report of which was given by Kelsey (Nautilus, 15:144).

Proof that Indian tribes of southern California found this large chiton an acceptable item of food is found in reports of valves occuring in kitchen middens on San Nicolas Island, and near Santa Monica, Redondo, and La Jolla (Berry,1922, p. 465).

Collecting Records: California: Los Angeles Co.: San Pedro (Willett)(Chace); White's Point (Burch); Malaga Cove (Burch); San Onofre (Burch). Orange Co.: Reef Point (A.G. Smith); Dana Point (Burch); Laguna (Willett). San Diego Co: La Jolla (AGS); San Diego, Oldroyd coll. (CAS); breakwater, North Island (AGS). Lower California:- (Outer Coast): Punta Banda and El Morro Point (Burch); Santo Tomas, Hemphill coll. (CAS); San Martin Island (F. Baker, Nautilus,16:42: South Bay, Cedros Island (Lowe, Nautilus, 27:28). Lower Calif. (Gulf): Angeles Bay, Hemphill coll. (CAS); San Carlos Bay (Steinbeck and Ricketts, P. 554); Conception Bay (Boone, 1928, p. 17).

The A.G. Smith collection has two sets of disarticulated valves (girdle not retained) from 3 miles north of Cayucos,San Luis Obispo Co., Calif., one set of which is probably I. conspicuus. Because this represents a considerable extension of range,because this extension would be north of Point Conception, which is the northern end of the ranges of many warm-water species, and because I. heathiana is found at this locality in unusually large size, it is thought best not to recognize the record until confirmed by specimens with girdle intact, which would remove all uncertainty of identification.

3. Ischnochiton corrugatus Pilsbry,1892.

Range: Catalina Island, California to Todos Santos Bay, Lower Calif. Type Locality: Catalina Island (Dall,1921).

Remarks: A Carpenter species, validated by Pilsbry in the Manual of Conchology but not figured. Dall lists it in the subgenus Ischnochiton s.s. where Carpenter placed it originally, but Pilsbry thought it ought to be listed as a Stenoplax although he has not seen specimens. A single specimen that seems to be adult, dredged by John Q. and Tom Burch in 25 fathoms off Redondo, California, answers the description fairly well and is referred to this species with some confidence. It is certainly a Stenoplax , belonging in the section Stenoplax s.s. as it has single slits in the median valves.

" Differs from Stenoplax sanguineus (* I. (Stenoplax) limaciformis Sowerby) in sculpture as well as in the mantle ornamentation. A specimen from Todos Santos Bay (under stones between tides) collected by Henry Hemphill is about the size of limaciformis from Mazatlan, and it would naturally be so-called; the sculpture, however, is sensibly different, both from that and from fallax. The central areas are minutely, and the jugal areas very minutely, wrinkle-punctate (the) wrinkles angular, irregular; lateral areas moderately defined and elevated, and, together with the end valves, irregularly, subconcentrically and strongly corrugated. Mucro median, planate. This species is a Stenoplax in form, but a true Ischnochiton in its imbricated scales, which are, however, extremely minute. This specimen is regularly arched, much less elevated than the type, with which, however, it agrees well in particulars. Length 21, breadth 9 mm." (Pilsbry, Manual, quoting Carp. MMS 14:123,124) .

The original description makes no mention of color except by reference to the variably colored limaciformis. The Burch specimen is externally a purplish red on all valves, with flecks of buff on the central areas that can hardly be said to be a prominent color feature, being almost lost in the red brown ground color of the shell. Internally, the valves are a lighter red around the central areas with a wash of dark color immediately adjacent to the sutures. The girdle scales are larger, wider, and thinner than those of fallax or limaciformis and are also more prominently striated. These striations are seen easily under a magnification of x45, whereas it takes about x90 to show the striations of the scales of the other two species. In addition, the girdle is sparsely set, toward the edge, with minute, broadly conic, pointed, glassy spines (barely visable at x20). One or two of these occur at the sutures also. This is a remarkable feature, not observed in any of the specimens of fallax or limaciformis examined. Careful study of other specimens, when they become available, should be made to determine whether this feature is a constant one.

Collecting Records: Type lot from Catalina Island, beach to 40 fms., J.G. Cooper coll. (said to be in the old California State Collection* Nos. 1066, 1070,1074); 25 fms. off Redondo Beach (Burch); a single specimen preserved dry and slightly curled, measuring 18.0 mm. in length and 7.2 mm in width. Five very much smaller and probably juvenile specimens from the same locality are provisionally referred to this species also, although they do not have the glassy spines heretofore mentioned.

* No longer preserved. A few lots from this collection are still extant in the University of California collection at Berkeley.

4. Ischnochiton fallax Pilsbry,1892.

Range: Vancouver Island, B.C. to Todos Santos Bay, L.C. (Dall,1921).

Type locality:- Monterey, California.

Remarks: Another Carpenter species, validated by Pilsbry. Berry (1922,p.462) records it from Fort Bragg, Calif. to the Santa Barbara channel, shore to 15 fms. It is found along with I. heathiana Berry under smooth rocks or boulders buried in sand or fine gravel, but is scarce. Superficially, it might be mistaken for highly colored heathiana but the girdle scales are extremely small, giving the girdle a leathery appearance when dry. The girdle of heathiana is distinctly scaly without the aid of a glass. In living specimens of fallaz the foot is reddish orange, whereas the foot of heathiana is light yellow, the darker foot of the former being at once apparent upon direct comparison.

" The peculiar features are the roundly arched outline and single slitting of the central valves, the terraced appearance of the lateral and terminal areas due to the very strong growth lines, and fine, wrinkly, radiating sculpture of these regions, and the very even and delicate ribbing and pitting of the central areas, though the ribs are hardly evident without a lens. All these characteristics serve to separate fallax from magdalensis (i.e. heathiana as now understood) and young conspicuus , with which it is alone likely to be confounded." (Berry, 1922, p. 462). It belongs to the section Stenoplax s .s. Two lots, together comprising ten specimens collected by the writer in the vicinity of Monterey and Carmel show the following range in external coloration: a light brownish-buff, with hardly any suggestion of mottling; red-brown, with sparse mottlings of wine-red; sea-green, strongly painted with buff and wine red along the jugal ridges; wine-red with buff markings, especially on the jugal areas of all except the head valve. Internally, the valves are more highly colored with red than most specimens of heathiana.

When full grown, fallax reaches the size of the largest heathiana, two large specimens, preserved dry, measuring about 62 mm. in length. A full grown specimen in the California Academy Collection from Union Landing,Mendocino Co. California, preserved in alcohol, measures about 70 mm. in length.

Collection Records: California:- Mendocino Co.; Union Landing (CAS); Fort Bragg Hemphill coll. (CAS); Agate Beach (Chace); Monterey Co.:- Pacific Grove a t Cabrillo Point, in a tide pool (A.G. Smith); Monterey Peninsula (Hunter); Carmel (Hunter, Chace); 5 mi/ S. of Carmel (AGS). Los Angeles Co/:- White's Pount, near San Pedro, T.S. Oldroyd coll. (Gordon coll.); off San Pedro in 20 fathoms, 2 young specimens (Willett); off Long Beach in 16 fms.; a full grown adult (Willett). Lower California:- Arbolitos Point, a single young specimen (Willett).

I. fallax has been reported fossil from San Pedro a t Nob Hill Cut and Deadman Island, the later locality beihg no longer extant. (Berry,1922,p.462)

5. Ischnochiton heathiana Berry,1946.

Range: Union Landing, Mendocino Co., California to Santo Tomas, Lower Calif.
Type locality: between tides, shore of Monterey Bay at Pacific Grove,Calif.
Description: Not in Oldroyd and taken from Berry's recent paper (A re-examination of the Chiton, Stenoplax magdalensis(Hinds), with description of a new species". Proc. Mal. Soc. London, Jan. 1946, vol.26, pt.6, pp 161-166, pls. 4,5), as follows:

" Animal moderately large, narrow, elongate; shell moderately elevated, with rounded to subcarinate dorsal ridge and weakly arcuate side-slopes.

" Anterior valve with numerous (60 to 70) low close radiating ribs, which usually are worn nearly or quite away at maturity, and also are varyingly noded by the stronger of the growth lines, with deeper interruptions brought about by intersection of the very strong resting stage marks; anterior slope straight or very faintly concave. Intermediate valves: central areas where unworn marked by fine close anastomosing wrinkles or riblets, more or less longitudinal on the jugum, diverging and more reticulate pleurally, with the interstices respectively either more or less groove-like or developed as shallow angular pittings; lateral areas sharply raised, flattened above, their sculpturing of13 to 18 low narrowly separated ribletsresembling that of the head valve. Posterior valve large, semi-lunate. with weakly projecting central mucro; central area sculptured much like the corresponding region of the valves in front; posterior area sharply raised anteriorly and sculptured with perhaps 60 to 75 low riblets similar to those seen on the anterior valve; posterior slope moderately concave.

" Interior of anterior valve often with a rather heavy callus across the apical half, bounded in front by a sharply jagged resting-mark; posterior border thickened and sharply elevated. Intermediate valves with weakly sinuous strongly projecting, rather narrowly rounded sutural laminae, with steep inner slopes leading into small notches at the sinus. Posterior valve with rather shorter, more evenly rounded laminae, the inner notches deeper and more oblique due to the sinus-plates being produced on each side into a small sharp slanting spine, a feature which may, prove somewhat variable. Eaves heavy, solid, projecting. Teeth squarish in terminal valves, more oblique in intermediate valves. Slits in disarticulated paratype 14, 3-1, 2-2 (plus 1 small), 2-2, 2-3 (plus 1 small), 3-2, 2 (plus 2 small)-3,9.

" Girdle moderately wide, clother dorsally by numerous very fine, crowded erect, incurved, rather loosely imbricating, blunt, finely striate scales.

" Ctenidia 36 on a side (paratype)

" Colour of dorsal surface of shell pale greyish or brownish cream (Pale 6live- buff to olive-buff), variably painted and flamed with light to dark greyish grey (mineral grey to dark ivy grey) in the younger individuals, usually wearing to a general dull greyish buff (near vinaceous buff) as the animals approach maturity. Dorsal surface of girdle varying from olive-buff to hair brown, with large cloudy spots or bands of light drab in the paler individuals to chaetura drab in the darker. Articulamentation of young animals usually rather creamy, with a suffusion of glaucous-blue, which may give way to pale vinaceous pink and light terre verte in older ones.

" Measurements of holotype: Max. long. 77/0 lat. 31.1, alt. 13.4, long. shell only 62.0 diam. tegmentum valve v 25.0, tegmentum valve vi 25.0 mm; of paratype - max long 68.0 max lat. 28.0, alt.13.1, long. shell only 62.0, diam. tegmentum valve v 23/2, diam. tegmentum valve vi 23.2 mm.

" Holotype: No. 7847, Stanford University Paleo Type Collection.

" Paratypes: Nos. 885,4728, and 8572, Berry Collection; others to be deposited in the collections of the San Diego Museum of Natural History, Hopkins Marine Laboratory, United States Museum, British Museum (Natural History), and the private collection of Allyn G. Smith."

Remarks: According to Berry (loc. cit.) this species has long masqueraded under the name magdalensis, which is a species described originally from Magdalena Bay, Lower Calif., and has a verified range on the ocean side of the peninsula of Lower Calif. from South Bay, Cedros Island to Cape San Lucas, and in the Gulf at Punta Penasco, Sonora, Mexico. I acrior Pilsbry, 1892 is placed in synonymy with I. magdalensis.

I. heathiana differs from magdalensis in the following principal particulars: a) the outline of the animal is elongate and narrower than that of magdalensis which is elongate ovate; b) the central areas of the valves are much more delicately sculptured, lacking the heavier transverse ribbing of magdalensis; c0 the lateral areas of the intermediate valves are much less prominently raised and have more delicatesculpture. Heathiana is immediately distinguished from conspicuus in the adult stage by its scaly girdle, finer sculpture, less prominent lateral areas, and the straight or only faintly concave head valve. (The had valve of conspicuus is strongly concave and often somewhat everted at the apex). In the young stage it is often difficult to distinguish between the two species but the shape of the head valve appears to be the best diagnostic feature in such circumstances.

The northern range of heathiana probably does not extend above Cape Mendocino. Although not rare by any means at Union Landing, above Westport in northern Mendocino Co., we failed to find it recently while collecting at Shelter Cove, in southern Humboldt county. Southern California and Lower California records for heathiana should be carefully checked to be certain they are not young conspicuus, particularly if the specimens are quite young(10mm The largest full grown specimens seen came from Cayucos,San Luis Obispo Co. California and measured 77 mm. in length. Large specimens from the Monterey region measure up to 72 mm. in length. Measurements are for specimens preserved dry. Fossil specimens have been reported from the Pleistocene at San Pedro (Nob Hill Cut) and at Deadman Id., in a formation of doubtful age but probably Pleistocene.

Collecting Records: California: Menddcino Co.: Union Landing (AGSmith, CAS); Fort Bragg,Hemphill coll (CAS); Little River and Albion (A.G. Smith);San Mateo Co.; Moss Beach(AGS). Monterey Co.: Monterey and Carmel (Many collectors 5 mi S. of Carmel (AGS). San Luis Obispo Co.: Cayucos (Burch, Hemphill,AGS) Los Angeles Co.: White's Pt. (Hemphill,Willett, Chace). Orange Co.: Laguna (Willett). San Diego CoLa Jolla (AGS). Lower California: Punta Banda and El Morro Point, young specimens (Burch).

6. Ischnochiton sarcosus Dall,1902.

Range: San Pedro, Calif. to the Gulf of Calif. Type locality, off San Martin Island, Lower Calif. F. Baker coll. (Dall,1902, p. 558).

Remarks: This is a scarlet and white, marbled species, of which the type measures 36mm. in length. The girdle which is " densely setwith small, curved smooth bristles of different sizes, dark red and white mixed", and the double slitting of the median valves immediatelysets it apart from the other red marked species, corrugatus and fallax. The relationship of sarcosus would appear to be closer to conspicuus than to any other species of the Stenoradsia group from the west coast. It must be a rare species, at least in California. Authentic specimens have not been examined.

Collecting Records: Portuguese Bend, near San Pedro, California (T.S. Oldroyd Coll.). Off San Martin Island, Lower Calif. (F. Baker Coll.).

* Note* The author will be grateful to have his attention calledto any errors of fact or of opinion in this section, or in the preceding or following sections of the review of the Polyplacophora. These will be corrected in an addendum, along with any additional valid collecting records, which it is hoped will be submitted by those interested, so that the review will be as complete and up-to-date as possible.

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Mr. D.L. Emery,121 Twentieth Ave.,South,St. Petersburg, Florida. " Dear Mr. Burch: In one of your recent issues I noticed an account of who had found the chiton Oldroydia percrassa. As my name did not appear with them I was surprised to see that of Dr. S.S. Berry so prominent. I always believe in giving credit where due no matter where it falls. If I remember the year correctly it was about 1914 when I was living in California. Mr. Berry came to my house to try to get a specimen of this chiton that I had found and dried flat without removing the mollusk. After some dickering I finally got his cleaned specimen and he got mine to soak in alcohol and dissect. Now in all fairness I think my name should have been added beside his."

Dr. H.A. Pilsbry - now on a visit to Lima, Peru advises that he plans to return in April and " The mollusk fauna near Lima is not very rich, and of cool temperate type, though only a few degrees below the equator.There are no Cypraeas, no Conus, no Spondylus or other tropical genera. Littorinas, Siphonaria, smooth black Tegulas,Crepidula and Mytilus are the commonest shells on the intertidal stones, with some limpets and chitons..."

COLLECTING AT TAMBOR

By Herman W. Miller

Sunday, Jan. 19, Mrs. Miller and I, with a friend of ours from the Bay Islands of Honduras, went to Puntarenas on our way to a long delayed trip to the Guanacaste peninsula. Puntarenas is the principal Pacific coast port in Costa Rica situated just inside the Gulf of Nicoya. We spent two days in Puntarenas. Then on Jan. 21 we rented a fifteen foot dugout with a sail and set out for the lower end of the peninsula. The first day we reached the corner of the peninsula and looked over a few beaches stopping at a place called Curd for the night. We slept at the home of an American rancher who has lived there about twelve years. The next morning, after hurriedly looking over the beach in front of his house, we left on our way to Tambor. If you will look at the map of Costa Rica in any good atlas you will see a bay set in about half way across the end of the peninsula. It looks small on the map but it takes a full hours paddling for two men in an otherwise empty canoe to cross the innder end of it. There are two towns. We arrived at Pochote, which, as one enters the Bay (Bahia de Hallena), lie to the right at the backof the bay where the Pochote River empties. Not finding a satisfactory place to stay, we made inquiries and found that most of the shells were at Tambor anyway. About two thirds of the way up to the left end of the bay the Panico River empties into the sea and a few hundred yards from its mouth is the city of Tambor (seven houses, some of bamboo and all but one grass-roofed). About a hundred yards farther we found a ranch belonging to one of the merchants who was willing to let us stay in a warehouse in his yard.

Right in front of the house was the place where most shells came up, every tide leaving that part of the beach covered with shells, mostly borken or faded. There seems to be a large number of species at Tambor, but there seems to be some reason why freshly dead shells rarely wash up on the beaches. Nearly all are faded and worn. Olives, and some kinds of bivalves are often found as good as new and without the trouble of cleaning out the meats, but most shells are extremely hard to find whole. Out of several dozen specimens of Turris picta I don't think we found one that was worth keeping. However, after hurriedly running through a part of the material (the rest is still too strong to bring into the house, I have a list of 262 species and subspecies besides some material that I was unable to identify quickly and needs more study. And perhaps some help.

From what we found on the beach, anyone financially able to charter a small launch and dredge that bay out to 20 or 25 fathoms depth certainly ought to get his money's worth in good shells. We found Tellidora burneti very plentiful but single valves always come up. We never found a pair nor have been able to match any. I would like to know if the shell fits exactly or gapes open. Many species of cones are common. I think more than fifty species are new to our collection. We found several species of Cancellaria but as usual, not many specimens of any. When I was in Los Angeles last time, Dr. Hill showed me a specimen, I believe from the Lewis collection, that was taken in Santa Elena Bay in upper Guanacaste and looked about like a Cancellaria brevis that had been partly unrolled until it looked more like a corkscrew than anything else. I was very much surprised about the third day at Tambor to find a specimen which I believe is the same species. It was an imperfect specimen, lacking the first whorls, but we kept looking and found more of them nearly every day one or more. They must have been spawning in shallow water, since Dr. Hill's specimen was dredged, if I remember correctly, in about 20 fathoms.

After the interest of beach collecting died down a bit, we began turning over stones on a rocky section near the house and found plenty of living Anachis rugosa and other species of Anachis, Acanthina brevidentata, Thais crassa, Bursa caelata, my first living specimens of Bursa, Cerithium adustum, and as the tide went lower I found a small dark olive shaped shell which I put into the bag without special notice until under another stone there was another all wrapped in its mantle. I then saw that they were the young of Cypraea cervinetta I was very anxious to get an adult and began to turn over larger rocks when to my surprise I turned over one and found four adults of different sizes. We spent a day or two trying to find the smaller species, C. robertsi and C. arabicula alive but without success. Can someone tell me where to look for them ? I don't know whether they live in deeper water or perhaps I just didn't turn the right stone, although there weren't many my size that I didn't turn. By the way, if any of you are coming down here to collectm you had better bring a good supply of heavy gloves along. We couldn't get any and out hands looked like something the butcher had worked on. It took several days to get comfortable again and I am sure we missed some species because we couldn't stand it to turn over more stones. I also got some little hairlike spines in my hand from some animal I didn't see, but they were very irritating and would have caused trouble if we hadn't dug them out.

The hermit crabs mostly wore common moon shells and broken pieces of Turritella, but once in awhile they made a worth while contribution,especially the tiny ones. I have some interesting small stuff to look over when the smell fades or I get a worse cold.

At the mouth of the Panico River there is a mangrove swamp where the usual Littorina pulchra, L. fasciata and L. varia are living with Thais kiosquiformis and some kind of Cerithidea is so abundant that it literally covers the ground and sometimes climbs the trees.

I also saw a lot of Howler monkeys (Congos) in the trees back of the house. The worst pests were the niguas. Sometimes miscalled chiggers, they are a type of flea. The female when small buries herself inthe skin usually hands or feet and there develops a large eggbag if given time. They cause intense itching and make sores when dug out. One night a scorpion about three inches long got in bed with me and I didn't like the way he said good morning. I felt rather bad all that day but was all right the next. We also had an adventure with a tree snake that dropped almost on my wife. I should have liked to collect him but I could not remember from the Snake Book whether he was poisonous so collected him with a machete.

(Partial List)

Shells Collected at Tambor, Costa Rica, Jan. 22-Feb.7,1947

Fissurella macrotrema Sby. ? new range
" microtrema Sby.
" virescens Sby.- alive
Acmaea mesoleuca Menke- alive
Tegula pellis-serpentis Wood- alive
" rubroflammulatum Koch
" ligulata Menke
Turbo saxosus Wood- alive
Astraea buschii Phil.
Nerita bernhardi Recl.-alive
" ornata Sby.- alive
" scabricostata Lam.- alive

Neritina latissima Brod.
Polinices glauca Humb.
" uber Val.
Natica broderipiana Recl.
" elenae Reeve
" chemnitzii Recl.-alive
" unifasciata Lam.-alive
" idiopoma P. & L.- alive
" catenata Phil.- alive
Sinum debile Gould
Aletes squamigerous Cpr.- alive
" centiquadratus Val.- alive

Crucibulum umbrella Desh.
" imbricatum Sby.
" trigonale A. & R
" spinosum Sby.
" radiatum Brod.
Crepidula aculeata Gmel.
" unguiformis Brod.
" excavata Brod.- alive
Calyptraea mamillaris Brod.
Hipponix barbatus Sby.
Archetectonica granulata Lam.
Littorina aspersa Phil.- alive
" conspersa Phil.- alive
" fasciata Gray- alive
" pulchra Sby.- alive
" varia Sby.- alive
Modulus catenulatus Phil.
Planaxis planicostatus Sby.- alive
Turritella banksi Reeve.
" nodulosa King
" goniostoma Val.
" tigrina Kiener
Clava gemmata Hinds
Cerithium maculosum Kiener
" adustum Kiener- alive
" s. exaggeratum P. 7 L.
" stercus-muscarum Val.
Cerithidea h. pulchra C.B. Adms. -alive
" montagnei Ord.
Strombus galeatus Sby.
" gracilior Gray
" granulatus Mawe
" peruvianus Swns.
Pustularia pustulata Lam.
Trivia radians Lam.
Cypraea arabicula Lam.
" robertsi Hidalgo
" cervinetta Kiener- alive
Malea ringens Swns.
Ficus decussatus Wood
Semicassis centiquadrata Val.
Cassis coarctatus Gray
Morum tuberculosum Sby.
Cymatium gibbosum Brod.
" lignarium Brod.
" tigrinum Brod.
" weigmanni Anton
Bailya anomala Hds.
Distorsio decussatus Val.
" ridens Reeve
Bursa albifasciata Sby.
" caelata Brod.- alive
Murex recurvirostris Brod.
Phyllonotus bicolor Val.
" brassica Lam.
Phyllonotus oxycantha Brod.- alive
" princeps Brod.
" radix Lam.
" regius Wood
Vitularia salebrosa King
Typhis cumingi Brod.
" quadratus Hds.
Thais biserialis Blv.
" crassa Blv.- alive
" kiosquiformis Ducl.- alive
" patula L.- alive
" triangularis Blv.
" triserialis Blv.
Cymia tectum Wood
Acanthina brevidentata Gray- alive
" muricata Brod.
Pyrene fuscata Sby.- alive
" labiosa Sby.- alive
" strombiformis Lam.
" major Sby.- alive
Anachis scalarina Sby.
" rugosa Sby.
" varicosa Gaskoin
Strombina recurva Sby.
" dorsata Sby.
Microcithara harpaeformis Sby.
Nassa pagoda Rve.
Northia northiae Gray
Cantharus anomalus Rve.
" elegans Gray
" vibex Brod.
" gemmatus Rve.
" ringens Rve.
" sanguinolentus Ducl.
Engina maura Sby.
Galeodes patula Brod.- alive
Fasciolaria princeps Sby.
" salmo Wood
Latirus ceratus Gray- alive
" concentricus Rve.
Leucozonia cingulata Lam.- alive
Fusinus dupetithouarsi Kiener
Vasum caestus Brod.
Mitra attenuata Rve.
" belcheri Hds.
" erythrogramma Tomlin
" lens Swns.
" swainsoni Brod.
Enaeta barnesii Gray
Harpa crenata Swns.
Marginella sapotilla Hds.
Persicula adamsiana P. & L.
Oliva angulata Lam.
" polpasta Ducl.
Agaronia testacea Lam.- alive

Olivella columellaris Sby.- alive
" semistriata Gray- alive
" volutella Lam.- alive
" zonalis Lam.
" dama Mawe
" gracilis Sby.
Terebra lingualis Hds.
" strigata Sby.
" luctuosa Hds.
" formosa Desh.
Conus princeps L.- alive
" purpurascens Brod.- alive
" fergusoni Sby.
" gladiator Brod.
" lucidus Mawe
" regularis Sby.
" emarginatus Rve.
" dalli Stearns
" perplexus Sby.
" archon Brod.
" brunneus Mawe
" vittatus Hwass
Turris picta Beck
" tuberculiferus B. & S.
Elaeocyma rosea Sby.
Cancellaria brevis Sby.
" obesa Sby.
" buccinoides Sby.
Bulla punctulata A. Ads.
Siphonaria characteristica Rve.-alive
" gigas Sby.- alive
" lineolata Sby.- alive

Arca pacifica Sby.
" tuberculosa Sby.
" mutabilis Sby.
" reversa Gray
" perlabiata Grant and Gale
" grandis B. & S.
" nux Sby.
" helblingii Brug.
" concinna Sby.
Glycymeris multicostatus Sby.
" inaequalis Sby.
Margaritiphora mazatlanica Hanley- alive
Pedalion chemnitzianum Orb.
Ostrea chilensis Phil.
" iridescens Gray
" mexicana Sby.
" megodon Hanley
Spondylus crassisquama Lam.
" limbatus Sby.
Pecten subnodosus Sby.
" tumbezensis Orb.
" opercularis L.

Pecten circularis Sby.
Anomia peruviana Orb.
" adamas Gray
" alectus
Eucrassatella gibbosa Sby.
Cardita crassicostata Sby.
" laticostata Sby.
Glans affinis Sby.
" radiata Sby.
Echinochama californica Dall
Chama buddiana C.B. Adams
" echinata Brod.
" pellucida Brod.
Cardium procerum Sby.
" biangulatum Sby.
" senticosum Sby.
" consors B. & S.
" magnificum Desh.
" elenense Sby.
" obovale Sby.
Dosinia ponderosa Gray
" dunkeri Phil.
Tivela argentina Sby.
" planulata B. & S.
" byronensis Gray
" hindsii Hanley
Macrocallista squalida Sby.
" s. biradiata Gray
" aurantiaca Sby.
Pitar callicomata Dall
" circinata Born
" c. alternata Brod.
" rosea B. & H.
" lupinaria Lesson
" unicolor Sby.
Antigona fordi Yates
" multicostata Sby.
Chione succinta Val.
" amathusia Phil.
" kelletti Hds.
" columbiensis Sby.
" gnidia B. & S.
Venerupis grata Say
Anamalocardia subrugosa Sby.
Donax aspersa Hanley
" assimilis Hanley
" californica Conrad
" obesula Desh.
" punctatostriata Hanley
" carinata Hanley
Iphigenia altior Sby.
Cyclinella subquadrata Hanley
Tellina crystallina Wood
Sanguinolaria purpurea Desh.
" vespertina P. & L.

Tellina rubescens Hanley
Strigilla sincera Hanley
" fucata Gld.
Tellidora burneti B. & S.
Pseudocyrena mexicana B. & S.
Tagelus violescens Cpr.
Pholas dilecta P. & L.
Pholadidea tubifera Sby.
Mactra exoleta Gray
Mulinia pallida B. & S.
Mactra clisia Dall
" a. subulata Morch

Macoma grandis Hanley
Mactra elegans Sby.
" angulata Desh.
Semele rupium Sby.
Raeta undulata Gld.
Trigoniocardia granifera B. & S.
Crassispira monilifera Cpr.-
Elaeocyma maculosa Sby.
Ellobium stagnalis Orb.
Cancellaria uniplicata Sby.
Olivella tergina Ducl.
Clathrodrillia alcestris Dall
Xenophora robusta Verrill

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CORRECTIONS OF CERTAIN NORTHERN COLLECTING RECORDS

By Walter J. Eyerdam

Shortly before George Willett passed away he listed a number of my Alaska pelecypods as doubtful identifications for various reasons. Recently I submitted all of these to Dr. Myra Keen for more thorough diagnoses with the result that eight of these species had been incorrectly named or had not been brought up to modern usage in names. Most of thsee had been classified by the U.S. National Museum or had been received in exchange from Mrs. Oldroyd, and Mr. Willett within the past twenty five years. In most cases the shells have been personally collected and submitted to specialists.

The following species are the ones that have been held in doubt and corrections made.

Name on Label	Locality	Corrected Name
Thracia curta	Drier Bay, Knight Island	Thracia challisiana Dall
" "	Hinchinbrook Id.	Thracia trapezoides Gabb
" beringii Dall	Atka Id.	Correct
Mya truncata uddavallensis Forbes-	Izhut Bay	Correct

(This variety if generally considered of doubtful sugnificance, and is probably an ecologic form. I have topotypes from Sweden of Pleistocene formation. These show a marked difference from the typical form. Some of my specimens are similar.)

Name on Label	Locality	Corrected Name
Glycymeris corteziana Dall	Forrester Id.	Glycymeris obsoleta Cpr.
Psephidia ovalis Dall	Hinchinbrook Id.	Correct
Axinopsis viridis Dall	Unalaska	Correct
Modiolaria corrugata Stimson	Unalaska	Correct
Phacoides tenuisculpta Carpenter	Drier Bay	Correct
Taras aleutica Dall	Unalaska	Correct
Venericardia paucicostata Krause	Atka Id.	Cardita (Cyclocardia) crebricostata Krause
Venericardia alaskana Dall	Izhut Bay, Afognak Id.	Same
" "	Victoria, B.C.	Same
Panomya ampla Dall	" "	Panomya turgida Dall
Macoma inquinata Deshayes	Atka	Correct
" " arnheimi Dall	Izhut Bay	Correct
" brota lipara Dall	Atka	Macoma liotricha Dall
" middendorffii Dall	Kamchatka	Correct
Thyasira gouldii Philippi	Drier Bay	Thyasira cygnus Dall
Clinocardium californiense Deshayes	Unalaska	Correct

Land Shells Collected in the Solomon Islands and Haiti

By Walter J. Eyerdam

Two days ago I received a box of returned shells including a number of rare species that I collected in the Solomon Islands with identifications; also some of the Haitian land shells that I collected in 1927 which have recently been described by Dr. Bartsch. These belong to the families Annulariidae and Cyclophoridae and represent a fraction of the over 1000 lots of land shells that I collected in Haiti in 1927 while collecting plants and reptiles. In this collection Dr. Bartsch has found many new species and erected four new genera including the following: X (new species) O(new genus)

Chondropoma (Chondropomium) superbum Henderson and Simpson
X " (Chondropoma) gonavense arcahaiense Bartsch
X " " " gonavense Bartsch
X " " eyerdamii Bartsch
Orcuttipoma rollei serraticosta (Weinland)
Parachondrisca umbricola umbricola (Weinland)
Hispanipoma quaternatum dentilobatum (Weinland)
X Haitipoma hinchensis Bartsch
Licina evoluta (Reeve)
" labeo (Muller)
X Weinlandipoma gonavense gonavense (Weinland)
Chondropoma (Chondropomorus) petitianum Clench & Aguayo
" " olssoni Pilsbry
X Crocidopoma (Crocidopoma) vortex elevatum Bartsch
X Chondropoma (Articulipoma) flexum Bartsch
X " eyerdami Bartsch
X Parachondrisca umbricola cayemitensis Bartsch
OX Hispanipoma quaternata (Lamarck)
OX Kisslingia hinchensis Bartsch
OX Klattea subreticulata Maltzan
X Licina cayemitensis Bartsch
X " pastelensis Bartsch
X Troschelvindex miragoanensis Bartsch
OX Eyerdamia eyerdami Bartsch
X Incertipoma subglobosum Bartsch

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Note on Cymatium (Turritriton) gibbosum (Broderip)

We were studying some specimens of Cymatium recently and sent a number of the puzzles to Dr. A. Myra Keen for an opinion. Among other species was a specimen Recent from San Pedro collected by Miss Edna T. Cook. Dr. Keen made the following comment about Miss Cook's specimen and the Pleistocene material of Mrs. Effie M. Clark. " I was interested to see the Cymatium material and am returning it by this mail. The specimens which Miss Cook and Mrs. Clark have are C. (Turritriton) gibbosum (Broderip) Miss Cook's is, however, the largest I have ever seen, about twice the size of the average specimen. It looks as though it had been living not too long ago and thus confirms Dall's range of San Pedro southward."

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* Note* - Beatrice L. Burch and Dr. Thomas A. Burch,1750 Kenyon St., N.W., Washington, D.C. are working on the Glossary of Terms for the Gastropoda, Scaphopoda and Amphineura. Members are requested to send them lists of any puzzling terms that in their opinion should be included in the new glossary.

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Mr. Joseph Gaylord will be at his home in East Longmeadow,Mass. until Nov.
Mr. W. G. Fargo will leave Florida April 10 for his home,506 Union,Jackson,Mich.

A COLLECTING TRIP TO MAZATLAN,SINALOA,MEXICO

By C.R. Mahaffey

Collecting shells at Mgazatlan was really a bi-product of a vacation trip to take in the yearly Carnival and was really at the wrong time of the year as the rainy season starts about June 15th and lasts until about Nov. 15th and during the rains the usual storms throw up on the beaches many shells not otherwise found unless dredged for. In February there had been no storms for several months and most shells found on the beaches were sunburned and well worn. I would guess that October and November would be about right if you are not afraid of thunder storms and their trimmings.

Weather and tides were just right, but in the past 25 years many changes have taken place at Mazatlan. A breakwater has been built from the mainland on the SE side of the port to the Isla de Piedra and a new one forms a channel to the inner harbor at " Astillero", these have changed currents and formed sand bars where there were none before. A dredge works, sometimes, and then many small shells are thrown out from the discharge pipe but as usual it was not working while we were there.

Oil has fouled the beaches in places and killed many forms of shells. During the past few years a considerable industry in making shell novelties has grown up and 8 or 10 persons make a living of sorts gathering shells to make these novelties,principally all bivalve shells, which they clean up daily, trivia to make heads of shell dolls, cowries for the bodies and olive shells for the arms, legs, hands and feet, in fact they gather up about everything along the beach within walking distance of town. Some shells to make bodies of shell animals and dye shells to make birds are also gathered. Hundreds of pounds of olive shells are imported from La Paz and some shells are brought from the Islas Marias or Penal Colony and the prisoners there make up shell goods, often spoiling fine shells to make a trinket selling for a dime.

We were in Mazatlan 9 days and the Carnival took up 5 days of that and I actually put in about 2½ days collecting in an amateurish sort of way and if I did not find many good shells I at least found out where they were not, which is something. The first half day I went along the point at the S end of town where the lighthouse is located, a short breakwater connectes the Creston Island, location of the light, to the peninsula on which Mazatlan is built. No shells found on the harbor or east side as oil has fouled the beach and rocks. On the W. the Gulf side only *Nerita* and dye shells were found and not many of those.

Next day I rented a canoe and two men for 15 pesos or $3.15 and we started out for the Venado Islands to the NW of town, but we started too late and the northwest wind came up too soon so we could not make it and turned back and collected on Chivo Island, near the Isla de Piedra. Many large dye shells found there and *Nerita*, and a few *Turbo* shells. Then we collected on the Isla de Piedra and found dye and *Nerita* shells in quantity. A short sandy beach at the juncture of the breakwater and the Isla de Piedra furnished a few cowry and trivia shells but a shell hunter had just been there before us so not much luck. Along the ocean side of the breakwater many small *Purpura* shells were found and on the Astillero side near the mainland 5 fine *Acanthina muricata* live shells were found at low tide in the rocks. A muddy rocky beach just east of the mainland end of the old breakwater was the best place found this day with several fine large cowries, *Murex radix*, and many small shells. However, some farmer has a fine herd of pigs who also collect on this beach and they probably get many shells. This breakwater is liberally sprinkled with some very vicious looking sea urchins and care must be taken to keep clear of them.

(con.)

Next day we got up early, and started again for the Vebado Islands and this time we made it. The day before the men with me had fished while I hunted shells and they had three very fine pargo or a sort of red snapper so for lunch the next day we had fried fish, French bread and red beans plus a few bottles of beer. There are 2 islands in the Venado group which look like 3 at a distance, and on the southerly island, which has a grove of cocoanut palms and is much visited on Sunsays by people in canoes from the Puerto Viejo or North Beach, about ½ mile across the channel between the islands and the mainland we found many bubble shells, a few Trivia and cowries at the SE end of the sandy beach, but all were found in a stretch some 75 feet long, rest of the beach being bare. On the Gulf side of the juncture connecting the islands or rather neck, many top shells were found on the rocks, and Turbo shells.

After cleaning up this beach we went to the island to the N. and where there are 2 sandy beaches some 200 yards apart. On these beaches many Trivia and cowry shells were found, all on the S end of the beach, many badly worn but some fine specimens among them, mostly under bunches of dry sea weed which protected them from the sun. The Trivia were all in fine shape. A few cone shells were found and many interesting small items. I am told there are times when these beaches are covered with shells, after heavy storms. In 1922 I gathered 10 gallons of them in a couple of hours, with about 90 varieties, on these same beaches. A sieve of bronze window screen would come in very handy here when there are many shells as the sand could be rapidly sifted and shells could be sacked and taken to Mazatlan for sorting at leisure. I think a sieve some 18 inches square would do the trick with a small shovel. Evidently the sea bottom off these islands is alive with shells and perhaps a small dredge operated from the beach would, with the use of a canoe, bring out many live shells.

That after noon we sailed back to port with the aid of the same reliable Northwester and on arriving at the sea wall at the Astillero I found, at the S. end of the sea wall, near a big crane used to handle concrete blocks, a stretch of sandy beach along the breakwater, many screw whelks, olive and cone shells, and other items. I visited this place several times later but the Carnival visitors cleaned up this place every day for shells as souvenirs.

The Estero de Urias or slough running back SE down the coast was not visited due to lack of time but many Murex radix are found there, these are called ' burros' by the local people and eaton by them. I was told that about 2 years a go an American came to Mazatlan and bought thousands of these Murex radix shells at 5 centavos each or about 1¢ US and generally cleaned up a lot of shells, They say he was from Los Angles but none know for sure. I am told many Murex and other fine shells live on the mud flats in these sloughs. The local Mexicans have a blind spot for seeing anything they cannot eat or sell so their descriptions of shell locations are not very reliable.

An American travelling salesman told me that on the Gulf west of Guasave thousands of shells were found by him in February.

Verdura Station on the Southern Pacific de Mexico is the station from which Guasave may be reached by auto stage and in Guasave a car can be rented to reach the Gulf, which is some 20 or 25 miles away. Car rents are reasonable along the coast.

Next time I visit Mazatlan I will investigate the Gulf coast near Modesto, some 15 or 20 miles NW of Mazatlan on the SP de Mexico as a friend has a ranch there on the coast, some 1 mile from Modesto,. He says clams, oysters and other shells about there, his ranch has a slough on one side and a river on the other. (con.)

A canoe with 2 men can be hired for 15 pesos a day or say $3.15 a day around Mazatlan. Room and board may be had at the Cosmopolita Hotel for 10 pesos a day or $2.10 a day. The cook is very cooperative in cooking live shells with the aid of a peso tip (20¢) from time to time. By now the local people are used to crazy gringos carrying sacks of shells through the streets as I have them used to the idea and after a few days everyone in Mazatlan knows all about you and you are offered all sorts of shells, good, bad, and indifferent.

Any quantity of shells should be checked as baggage as if they are shipped by express they must have a " guia" or clearance from the local Fish and Game people. There is a tax of 1 centavo a kilo on shells and this is 1/5 cent a kilo of 2 1/5 pounds,but the trouble of getting the guia is more than it is worth, no questions areasked on baggage and no trouble was found in getting a foot locker full of shells across the border through the Mexican customs. The Fish and Game, or " Caza y Pesca" boys have an office in the Federal or Postoffice building.

I have in mind donating a few exhibition cases to the local Public Library for a collection of shells,and anyone visiting Mazatlan should visit the library about this idea. It may be possible to make Mazatlan shell conscious and some local collectors may be turned up by this method.

Escuinapa, SE of Mazatlan, has many sloughs on the coast and all along the coast North West and South East of Mazatlan there are many fine beaches and sloughs, which have not been worked over. Escuinapa is also on the S.P. de Mex.

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News From and About Collectors

Heathcote M. Woolsey, Green Pastures, Kent, Conn. " I have beenaway for six or seven weeks to Jamaica where I had a pleasant time collecting shells from this neighborhood. It is not what would be called a good collecting ground although in two seasons I have beenable to accumulate a wide variety of genera. My method has been largely to interest the fishermen throughout the island in saving the biproducts of their fish traps.Also, persuading the boys who dive for Strombus gigas to keep an eye open for other shells less conspicuous. The beach collecting is, in large part, unrewarding. There is a reef surrounding the island and this, combined with a very low tide, about 18", makes it difficult to obtain shells inside the reef.

There is one beach, however, at the extreme end of the island called Negril Point, which would excite the most blasé collector. The only difficulty is that it is a malarial section, thirty miles from the nearest night's lodging, and the best part of the beach is six miles from where one can drive a car. One or two shells which I had previously considered fairly rare I found in considerable quantity. One particularly, Strombus gallus, I have obtained some thirty good specimens and would be very glad to exchange with west coast collectors who may not have this beautiful Strombus. Of course, there would be other shells which I could include in a box, all live specimens when taken.

Woody Williams,418 Belvedere St.,La Jolla, Calif. " ... My principal interest in mollusks at the present time concerns their ecology and distribution along the west coast of Lower California. I am attempting to clarify the confused distribution and explain it somewhat on the basis of the known oceanographic factors. I am slowly gathering material for the project, but got a good start last spring when a La Jolla friend invited me to go with him in his small sloop as far south as Scammon lagoon.We obtained a fair representation from this area as well as from the offshore islands. Last December

(con.)

I went with the Scripps to Guadalupe Island and obtained a good series of marine mollusks, both from the intertidal and sublittoral down to about 40 fathoms. The Scripps also carried a diver who brought up bottom samples of rich in small stuff.

Dr. Henry van der Schalie, Univ. of Michigan, Ann Arbor, Mich. " It is possible the Larocques will join my wife and me on our trip to the meeting in June. We are looking forward to an opportunity to meet folks on the west coast we have learned to know through literature and correspondence but have unfortunately not yet met in person."

Dr. F. Haas, Chicago Natural History Museum, Chicago, Illinois. " I am afraid I shall not be able to come to this year's Malacological meeting in Pacific Grove, since I have plans to go to Bermuda this summer; that will deprive me of the chance of meeting you personally this year, which makes me very sorry."

Francis N. Balch, 130 Prince St., Jamaica Plain, Mass. We welcome Mr. Balch to our group as a new subscriber to our paper and hope to hear from him often. " I felt greatly flattered, and therefore pleased, recently by having been chosen " Honorary President for Life" of the Boston Malacological Club."

Dr. H.B. Stenzel, Bureau of Economic Geology, Univ. Sta. P.O. Box B, Austin 12, Texas. Dr. Stenzel was in Los Angeles to attend the meeting of the Petroleum gologists and we enjoyed our brief visit with him. The editor was, of course, delighted to have a visit with a representative from his Alma Mater, even though assured that by now he would never recognize the campus he left in 1914. Dr. Stenzel was en route north where he hoped to meet Dr. Myra Keen and others. We regretted that he could not stay with us longer.

Dr. Irene McCulloch, Hancock Foundation, University of Southern California, Los Angeles, Calif. " ... The Allan Hancock Foundation is having Open House on April 17 during the afternoon with the program of events being published soon in all of the local papers."

Dr. McCulloch is still trying to purchase the first 12 volumes of the Nautilus.

Professor Trevor Kincaid, Bureau of Animal Biology, Univ. of Washington, Seattle 5, Wash. " Last summer I discovered an extensive bed of the Japanese clam Paphia philippinarum in Willapa Bay, which is a new record for that locality. Some of the specimens are rather prettily marked so I am sending you a few for a " look see".

" In connection with the discussion in re the preparation of chitons- I may take the liberty of outlining my own tecnique, which is probably no better or worse than the ones suggested. The animals are placed in a pan of fresh sea water to relax. When well flattened out they are picked up quickly and held in the hand and worked a bit while they are held under a tap from which is flowing water as hot as the hand can bear. The animals die very quickly and are then flattened down to a narrow strip or shingle by strips of muslin, after which they are placed in a dish of formaldehyde to harden. The following day they are removed from the srtips and are cleaned of their internal organs. They are then ties back in place and placed in a dish containing a solution of formaldehyde to which about 10% of glycerine has been added. Remove from the solution and let them remain on the strips till dry. The specimens retain sufficient of the glycerine to cause them to remain slightly flexible and they do not develop the shriveled appearance of the ordinary specimens."

Mrs. F.K. Hadley, Box 33, West Newton 65, Mass. Mrs. Hadley mentions that the Boston club has a growing membership- meeting every month in the year except July, Aug. and Sept. We thank her for the compliment to our Minutes. Mrs. Hadley is a dealer in fine specimen sea shells.

* Note*- We are busy building some nice new dredged to use when we meet in June at Monterey for the meeting of the American Malacological Union. Mr. A. Sorensen is arranging for the boats, Mr. Allyn Smith, Dr. Hanna and I and we hope others will bring along their gear. We hope to get some nice fresh deep water material for our guests and make all those who fail to attend "sorry they d idn't.

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Dr. E.W. Gifford and Delila S. Gifford, Museum of Anthropology, Berkeley, Calif. Professor Gifford is conducting an expedition to the Fiji Islands where he expects to engage in archaeology. We will miss them at our June meeting but wager that they bring back a fine collection of shells from Fiji this fall.

Dorothea Franzen,Cedar Crest College,Allentown, Pa. We are pleased to welcome her to our group and add her name to our subscribers. It is hoped that we will hear from her often.

Charles B. Wurtz,5055 Copley Road,Philadelphia 44, Pa. We are pleased to have him with us and hope to not only have him with us in person but to hear from him often with more interesting data as " I find your article on the fresh water mollusks very interesting, and would like to contribute an item of information which may or may not be new to your California collectors. But here it is at any rate. While stationed at Camp Roberts '44 to '46 I became much enamored of the Monterey Peninsula area (and still am), and bought a home in Robles del Rio which is 14 miles up the Carmel River from the ocean. Among other things I visited the Hopkins Marine Station and met Dr. Bolin, icthyologist. He told me there were no fresh water mollusks in the Carmel River so far as he knew. Being of an inquisitive nature, like all snail hunters, I proceeded to hunt for them. After many hours in the river over a period of several week ends I finally managed to find three specimens of Physa in the river at Robles del Rio. I still have these specimens in alcohol somewhere. Since I am not actively working on fresh water material I have made no effort to place these as to species. My impression is, however, that before proper identity of a Physa can be made the entire family will have to be studiedd and revised, which is, of course, a major undertaking.

I also have some specimens (possibly a dozen) of Physa from the small stream in Bear Gulch, Pinnacle Nat'l. Monument, San Benito County. These are also in alcohol. If this material is of any interest to you I would be glad to send it out to you. Perhaps the Californian Physa are distinct enough to be separable to species on purely conchological grounds."

" I also have seen Physa in the Nacimiento River just above its confluence with the Salinas River, but I did not collect any here since I had a company of Infantry to consider at the time. "

* Note* Inasmuch as we are at this time working on the fresh water fauna of California we will sincerely appreciate these specimens for study as well as any other material members may have in this group.

Dr. Hans Schlesch, Pernillevej 23, Bispebjerg,Copenhagen NV,Denmark. Dr. Schlesch may well ask why Corbicula fluminalis was included in the list of marine pelecypods. The only answer is that the editor only wishes that his greatest error might be that of including a fresh water species with the marine. " I should also ppefer Portlandia to Gouldia. I notice that Achatina has been imported to Guam.This species was imported in 1847 to Calcutta, appeared in 1900 on Ceylon- already in 1918 about 10,000 specimens were destroyed in the botanic garden at Paradenza on Ceylon. According to the year book of the Ceylon Dept. of Sgric. (1926,p.62) in 1925 about 60,000 specimens were killed by 7% copper sulphate."

Minutes of the Conchological Club of Southern California-April,1947

At the usual time and place, the Conchological Club of Southern California was called to order April 1,1947 by the president Dr. W.O. Gregg.

There were thirteen members and three visitors present. The visitors, who desire membership, Mr. and Mrs. D. Dwight Taylor and their son Dwight W. Taylor, 1955 Mendocino Lane, Altadena, Calif.

Dr. Hill reported a severe accident suffered by Miss Agnes Shumate, whose address is 1433 Sixth St., Santa Monica, Calif. This will result in her confinement in a cast for a considerable time. The club expresses sympathy and hopes for a complete recovery.

New publications were notes and will be eviewed elsewhere in the Minutes.

Several papers to be read by members of the club at the June meeting of the A.M.U. were discussed.

Mrs. Clark gave a biographical sketch of Thos. Nuttall which will appear later in the Minutes and also exhibited a considerable collection of fossils all not yet identified from the locality at eighth and Palos Verdes Streets, San Pedro.

It closely compares with T.S. Oldroyd's Nob Hill list but lacks a few of his species and has others not listed. This list when completed will be found in the Minutes.

At the invitation of Mr. Kanakoff the meetingadjourned to visit the installation of the Newport Bay collection recently placed in the " bone" room, and it is a very interesting one indeed.

Effie M. Clark- Secretary.

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March Meeting- 1947 - The Conchological Club of Southern California met at the usual time and place Tuesday, March 4,1947. The meeting was called to order by the president Dr. W.O. Gregg with 20 members and 3 visitors present. The visitors were Helen L. Smith, 222 N. Pine St., Orange, Calif- Jerry Barhard, 700 Wallis St., Los Angeles- and Joan Desmond, 830 Burnside Ave., Los Angeles 36. All were voted to membership.

We were glad to have with us again, an old time member, Chas. Schlagel, whose address is now 2614¼ N. 17th St., Los Angeles, Calif.

There were several communications which will be summarized elsewhere in the Minutes. Mr. George Kanakoff reported the uncovering of a fine fossil bed by an excavation for the outfall sewer at Main and Lomita Blvd. in Lomita. The subject for the evening was given by Dr. Howard R. Hill-Terebra. This family does not loom large on our horizon as to numbers of species and those we have are not easily obtained but other places, particularly the warm water regions, do have large and beautiful shells of this group. The large collection that Dr. Hill brought to illustrate his very interesting talk showed that " Auger Shells" can have graceful slopes and beautiful coloring and a great variety of sculpture and color design.

Motion was made that a committee of 3 be appointed to cooperate in arranging the A.M.U. meeting June 18-21. The president appointed John Q. Burchasking him to name two others to compose the committee. The meeting was thenadjourned. Effie M. Clark, Secretary.

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Meeting of the Long Beach Shell Club- March 9th,1947

Meeting was called to order by the president, Emory Chace. Four visitors were present, Mrs. J.A. Connor, and Mrs. Hazel Grant of Long Beach. Dr. and Mrs. Thomas S. Kingston, members of the St. Petersburg, Florida Club. There were 25 present at the meeting. The 1947 programs of the Long Beach Shell

(con.)

Club were distributed among those present, and a vote of thanks was given Mr. Baker for making the programs. Mr. Baker called the attention of the club to an article in the Sunset Magazine by Dr. Chapman regarding a battle between an Octopus and a halibut. Motion made and seconded to renew the subscription to Mollusca and pay the membership dues of the club to the Malacological Union which expires June 1. It was hoped that we could send a delegate from our group to represent the club at the meeting in Pacific Grove on June 18th to 21st. A letter was read from Miss Ruth Eaton from St. Petersburg, Florida telling of the shell exhibit that was put on by the club and how much interest it aroused. Mr. Chace introduced Mrs. Lehman who gave a very interesting talk on how they started shell collecting and the different ways of mounting shells. Illustrating the different ways for the purposes used. Riker mounts of shells found in and around Long Beach were displayed by Mr. and Mrs. Ralph Bormann showing the work that was done by the children in Junior High. Shells from Saipan and the Republic of Panama were also included in the exhibit. In the absense of Mrs. Chace her paper on shells and shell collecting was read by Mrs. Bormann giving new members some very interesting tips on shells. Mr. Chace gave some very interesting facts on chitons. Mrs. Lehman announced that a Mrs. Bornoman of 3815 East 1st, a shut-in, would like to contact some of the members of the shell clubs.

Motion was made and seconded that Dr. Lloyd of the Cabrillo Museum be made an honorary member of the club and be invited to attend the meeting whenever possible. Ralph Bormann, Secretary.

* * *

Mr. W.J. Eyerdam. Seattle, Wash. " I have just received a letter from Professor Eric Hulten, director of the botanical division of the Riksmuseum stating that Professor Sixten Bock, director of the zoological division of the Riksmuseum has died and that Prof. Nils Odhner, one of the foremost European malacologists has succeeded him. I remember Dr. Bock very well as I was his special guest at the Swedish Explorers Club in 1930 one night when I came out of Russia the last time. He showed me his superb monograph on the Planarian worms of the world all done in natural colors on large plates. About 25 years ago Dr. Bock explored the Bonin and Volcano Islands and discovered a number of new species of shells including at least one of the Amphineura. Perhaps some of our armed force shell collectors have combed over these islands as they have so many others."

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Some Additional New Papers Received for the Library

Dr. Curtis L. Newcombe, Cranbrook Institute of Science, Bloomfield Hills, Michigan sent some very fine publications which we are very happy to have.

" Report of the Virginia Fisheries Laboratory of the College of William and Mary and Commission of Fisheries", 1946, 39 pp. a number of plates and text figs. The early development stages of the oyster are well illustrated, and an excellent figure and discussion is made of the drills, Urosalpinx and Eupleura.

" Future of the Virginia Oyster Industry" 1945 By Curtis L. Newcombe and R. Winston Menzel. 11 pp- text figs.

" Life History of the Oyster" Reprint from Turtox News, Aug. 1946

" Growth Indices of Littorina irrorata " Parts I & II. 1937 Reprint from Biologia Generalis vol. XIII. 16 pp, text figs.

" Variations in Growth Indices of Venus Mercenaria L..." Canadian Journal of Research 1938 5 pp

A number of excellent papers on crustaceans - the Blue Crab were also included.

SHELL BOOKS FROM HAWAII

There are a number of good books published by the Bernice P. Bishop Museum that should answer many of the problems being asked regarding species from not only Hawaii but other Pacific Islands. Orders for any of the following books will be given prompt attention if sent to John Q. Burch, 4206 Halldale Ave., Los Angeles 37, Calif.

" Reef and Shore Fauna of Hawaii" by Charles Howard Edmondson. 1946 $3.00
This new publication covers not only the mollusks but the other forms of life. It is to be recommended as well worth adding to your library.

" A Manual of the Recent and Fossil Marine Pelecypod Mollusks of the Hawaiian Islands " by Dall, W.H., Paul Bartsch and Harald A. Rehder. 1938. 233 pages 28 text figures, 58 plates. Price $4.00.
This is a very thorough work and should be in the library of all students of Pelecypoda whether interested in the Hawaiian fauna or not.

" Zonitid Snails from Pacific Islands" by H. Burrington Baker. This work is in three parts as outlined below. Total price $7.00.
Part I- 1938 102 pages 20 plates $2.00
Part II-1940 pages 105-201 plates 21-42 $2.00
Part III- 1941. Genera other than Microcystinae; Part IV Distribution and Indexes. pages 205-370, plates 43-65 $3.00

" The Land Snail Genus Carelia" by C. Montague Cooke Jr. 1931 97 pages, 18 plates, 2 figs. $2.00

" Distribution and Variation of Achatinella mustelina Mighels in the Wainanae Mountains,Oahu" by d'Alte A. Welch 1938 164 pages 1 fig. maps,13 plates $2.00

" Land Snails from Hawaii,Christmas Island, and Samoa" by Pilsbry,H.A. , C. Montague Cooke Jr. and Marie C. Neal. 1928 49 pages 22 figs. $1.00

" Check List of Hawaiian Land and Freshwater Mollusca" by Edward L. Caum 1928 79 pages $1.00

" Fossil Marine Mollusks of Oahu" by J.M. Ostergaard. Describes 62 species of gastropods and 9 pelecypods from the raised reefs of Oahu. Discusses the relation of fossil to living Pacific faunas. 1928. 32 pages,1 pl. $1.00

" Recent and Fossil Marine Mollusca of Tongatabu" by J.M. Ostergaard 1935 59 pages, 1 fig., 1 pl. $1.00

The following books have no relation to conchology but should certainly be in the library of anyone interested in the Hawaiian Islands.

" Plants of Hawaii National Park" " Illustrative of Plants and Customs of the South Seas" by Otto Degener 1945 314 pages 95 plates and maps $2.50

" Flora Hawaiiensis or New Illustrated Flora of the Hawaiian Islands" by Otto Degener Books 1-4 bound within a single volume. 1192 pages, of which 429 are full page plates. This is a limited edition of 3000. now in the bindery. Price $6.00.

" Tropical Plants the World Around" by Otto Degener. There are two well illustrated pamphlets of this series- numbers I and II. They are of about 20 pages and are reprinted from the Journal of the New York Botanical Garden. They are well worth the 25¢ each asked.

WONDERS OF THE GREAT BARRIER REEF

BY T.C. ROUGHLEY

WITH 52 NATURAL-COLOR PHOTOGRAPHS BY THE AUTHOR

NEW 1947 PUBLICATION.

The Great Barrier Reef of Australia is one of the great natural wonders of the world. It is the greatest barrier reef in existence, and for interest, variety, and beauty of the life it contains it is probably unrivaled by any other region of similar extent, whether on the land or in the sea.

In the Great Barrier Reef nature has allowed herself to run riot. Marine animals which elsewhere are small and inconspicuous may grow there to be giants of their race; those which elsewhere are drab and unattractive may be seen there displayed in the most brilliant of colors.

So this book is an attempt to tell the story of the wonderful life of the reef, to give the reader an accurate impression of the color of some of its inhabitants.

Announced for publication in April. Price $5.00.
Orders being accepted by John Q. Burch, 4206 Halldale Ave., Los Angeles 37

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A few other books of possible interest follow:

" Sea of Cortez" by John Steinbeck and Edward F. Ricketts. This volume is of real interest to the student of the fauna of west Mexico and the Gulf of California. 512 pages and many illustrations $5.00

" The Wayward Bus" by John Steinbeck 1947. This book is fiction and has nothing to do with science. However, a new book by Steinbeck is always an item of interest. $2.75

Oldroyd, I.S. " Marine Shells of Puget Sound and Vicinity" $2.75. This is far from a new book but is again available.

Oldroyd, I.S. " Marine Shells of the West Coast of North America" 4 vols. $8.50. This work has been out of print but is again available. Those who ordered it last fall and summer and did not get it may now reorder if they wish and prompt shipment will be made.

Guberlet, Muriel Lewin " Animals of the Seashore". 412 pages and many full page illustrations- photographic. This little book is not new having been published in 1936. However, it is of interest to those interested in the other forms of life than mollusks. The book deals with the fauna of the Pacific Northwest. Published in Portland, Oregon. $2.50.

Willis, Elizabeth Bayley- " Little Bay Creatures"- JUVENILE- If you have some youngster between about 8 and 12 whom you wish to interest in marine life this might be worth the $1.50. Good illustrations.

" THE NATURALISTS LEXICON" by Robert S. Woods- 300 pages 6x9. $2.75
This book is sincerely recommended for all libraries.

Stiles, Walter " Trace Elements in Plants and Animals" 1947- $2.50

Nichols, John T. and Paul Bartsch " Fishes and Shells of the Pacific World" 1945 $2.50

MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA
May 1947

Subscription $2.50 per year

We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, California. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.

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We wish again to urge all who have not made reservations for the meeting of the American Malacological Union at Pacific Grove in June to do so at once. Write Mr. A. Sorensen, 247 Granite St.,Pacific Grove,Calif. June 18 to June 21.

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New Publications Received

News Bulletin and Annual Report,1946 of the American Malacological Union. The membership list is revised to April,1947. A fine paper on the life of the late Dr. B.R. Bales with his photograph by Thomas L. and Paul L. McGinty is included and a detailed report on the meeting of 1946 in Washington, D.C. with a review of the papers read at the meeting.

Systematic Monograph of the Patelliformia by Bengt Hubendick, Uppsala,Sweden. This excellent work of 93 pages plus 6 pages of plates is a work that should be easily available in every conchological library. It is in English and discusses all described species of the Siphonariidae and Gadiniidae. All species from this coast are described, figured and differentiated. The comments on Williamia are of special interest to us. There is no doubt but that this work will be the first thing on the table when a problem involving this group comes up. 1946

Phylogenie Und Tiergeographie Der Sipnonariidae Zur Kenntnis Der Phylogenie in Der Ordnung Basommatophora Und Des Ursprungs Der Pulmonatengruppe by Bengt Hubendick,Uppsala,Sweden,1945. This is a very thorough work on the anatomy of the Siphonariidae. 216 pages with excellent illustrations. In German.

Report of the United States National Museum, 1946. 113 pages

Fish and Shellfish of the Middle Atlantic Coast by Rachel L. Carson. Conservation Bulletin No. 38. 32 pages. 10¢ from Supt. Pub. Documents
Fish and Shellfish of the South Atlantic and Gulf Coasts by the same author Conservation Bulletin No. 37. 45 pages. 10¢ from Supt. Pub. Documents
Food from the Sea- Fish and Shellfish of New England- by the same author Conservation Bulletin No. 33. 74 pages- Price 15¢
Fishes of the Middle West by the same author. Conservation Bulletin No. 34 44 pages- Price 15¢

The Onychophores of Panama and the Canal Zone by Austin H. Clark and James Zetek- Proc. U.S. Nat. Mus. Vol. 96, No. 3197. 10 pages 1946

A Guide to the Literature and Distributions of the Marine Algae of the Pacific Coast of North America by E. Yale Dawson. Memoirs of the Southern California Academy of Sciences Vol. III, No.1, Jan. 20,1947.
134 pages- an excellent check list of the marine algae of this coast. Price $2.00.

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Mrs. North McLean of Washington, Connecticut died on March 25th. We will always recall her visit in Southern California with pleasure. Our deepest sympathy goes to Mr. McLean in his bereavement. Mrs. McLean was an active collector and exchanged to some extent particularly with duplicates of fine West Indian species personally collected. Her label is now on some very highly prized sets in our collection.

Dr. Maxwell Smith, Winter Park, Florida " It may be that I shall attend the meeting in California this summer and I look forward to meeting you at that time." We hope to hear the same from all of our friends in the east.

Dr. Joshua L. Baily Jr., 4435 Ampudia St., San Diego, Calif. Miss Bristol of the San Diego Museum advised us on April 21 that Dr. Baily was operated on for apendicitis the week before, but is now home and getting along nicely.

Dorothea Franzen, Cedar Crest College, Allentown, Pa. " I am accepting a position in the Dept. of Biology, Washburn Municipal University, Topeka, Kansas. I shall remain at Cedar Crest until June 2. After that date please address my mail to the new address."

Charles R. Locklin, 636- 16th Ave., N.E., St. Petersburg, Fla. We are happy to welcome Mr. and Mrs. Locklin to our Minutes circle. " ... My wife and I are interested in fossils, and have collected Chipola Miocene extensively near Tallahassee. We have duplicates of names species. If you would like to have some, let me know. (* the editor is always happy to receive specimens and has an extensive collection of fossils) The Pliocene fossil shells of Florida that we collected is being published by the Academy of Natural Sciences of Philadelphia. After publication we can send you some of these."

Rev. Paul D. Ford, Box 924, Nassau, Bahamas. We lost the correct address for some little time. Dr. Ford advises that he is at Nassau most of the time but " My permanent earthly address is Sunbury, Pa. There I own my home and have my complete collection of shells housed. Any mail, at any time, addressed to Sunbury will always reach me. But I also own my own home here in Nassau, and am a resident missionary here. So as I am here most of the time, this Nassau address would be the proper one to put in the Directory. I am constantly getting new shells here, and have a large supplyof exchange shells on hand. I have also discovered a few new species lately. Dr. Pilsbry plans to list them in the Nautilus. " * Note- If you are fortunate enough to arrange an exchange with Dr. Ford you will probably find yourself placing some of them in your " treasure chest" if you have one.

Mrs. George Bengston, 2580 W. 3rd St., Waterloo, Iowa. We are happy to welcome Mrs. Bengston to our Minutes circle also. " Do you know of any members that would be interested in land and fresh water shells of this district ? This summer I can collect different species of snails and naiades from the Wapsipinicon and Cedar rivers. Last year the rivers were down very low and I found several fossil shells in the limestone and many pieces of cup coral- Iden. by the U.S. Natl. Museum as Cyathophyllura. This particular coral characterizes the Devonian ... These cup corals unlike many Recent species, consist of a single animal which lived in the very ancient seas ... If anyone is interested in them I will be glad to hear from them."

The following paper is a continuation of the work on The Fresh Water Mollusca of California by Wendell O. Gregg, M.D.

Order TELEODESMACEA Dall

" Pelecypods with reticulate gills, the ventricle of the heart embracing the rectum; having the mantle lobes more or less connected and usually possessing developed siphons; the aductors practically equal; the shell structure cellulo-crystalline (porcellanous) or obscurely prismatic, never nacreous; the dorsal area, when present, always prosodetic or divided into lunule and escutcheon; ligament opisthodetic, with or without separate resilium; without a lithodesma, rarely with external accessory shelly pieces; nepionic stage usually without a taxodont provinculum; permanent armature of the hinge characterized by separation of the hinge teeth into distinct cardinals and laterals; the posterior laterals, when present, placed behind the ligament; the animals active or nesting, sometimes sessile, but rarely sedentary burrowers, rarely inequivalve, usually possessing a hinge plate and a pallial sinus; sexes usually separate." (Dall)

Superfamily CYRENACEA Tryon

" Cypricardians which have become specialized for fresh water or brackish water conditions, and as usual in such cases, have developed variability of character." (Dall).

Family CYRENIDAE

Shell trigonal to oval, moderately or very solid, porcellanous, covered with a yellow to olivaceous or brown periostracum; hinge-plate developed, bearing 2 or 3 cardinal teeth diverging from the beaks in each valve, and anterior and posterior lateral teeth. Ligament external; pallial line entire in most genera. The mantle is free, except posteriorly where a partition divides off a siphonal cavity. Siphons quite short and separate or represented by mere orifices. Gills concrescent posteriorly. Labial palpi rather short, triangular. Oviparous so far as known,

Genus CORBICULA Megerle v. Muhlfeld, 1811

" Trigonal to ovate Cyrenidae in which the lateral teeth are long and closely crenulate. Usually the exterior has concentric sculpture, and the interior more or less violaceous color. Animal with two short siphons, both provided with papillae at their apertures."(Pilsbry & Bequaert, 1927, p. 338).

Type: *Tellina fluminalis* Muller.

Distribution: " The genus *Corbicula* is at present distributed over the Ethiopian Region, Madagascar, southeastern Europe, southern and eastern Asia, the Indo-Malayan Region, eastern Australia, and Tasmania. During the late Pliocene and the Pleistocene, however, it extended over much of central and southern Europe, as far as western Great Britain. Closely allied forms (*Cyanocyclas*) are found living in South America." (Pilsbry and Bequaert, 1927, p. 338). Rather recently it has been found in the Pacific Coast region of North America, apparently an introduction.

Corbicula fluminea (Muller),1774. Verm. Terr. Fluv. Hist. II, p. 206.

"Testa gibba,opaca,antice & postice versus cardinem fere aequalis; extus viridis costis latis transversis quasi circulis doliaribus circumdata; intus albida semicirculo nigro notata. Cardinis dentes & fossulae,uti in praecedente. Long. 6-8 lin. Lat. 6-8 lin." (Muller,1774, p. 206).

Type Locality: China

Distribution: China. Pacific Coast Drainage; North America,introduced. First observed in North America by John Q. Burch who took numerous specimens in 1938 on the north bank of the Columbia River in Pacific County, Washington, about 2 miles east of Knappton. Later Miriam Shepard and Harold Harry found specimens in the Willamette River near its junction with the Columbia. More recently Dr. G.D. Hanna has taken numerous specimens in a drainage ditch into Sycamore Slough on the South Fork of the Mokelumne River, San Joaquin Co.,California, as wellas other localities in central California. Mr. M.L. Walton reports it from the Sacramento River above Isleton.

Family SPHAERIIDAE Dall,1895

" Shell small and thin, ligament feeble,short;pallial line simple; no hinge plate; cardinal teeth usually two in each valve; laterals four in the right valve,two anterior and two posterior and two in the left, one anterior and one posterior; foot long,narrow,grooved,byssiferous when young;monoecious; the young incubated in a marsupium formed by the inner gill." (Walker, 1918, p.85).

The Sphaeriidae constitute an interesting but difficult group. The small size of the *Pisidia* make them increasingly difficult to study. Since the days of *Temple Prime*, author of Monograph of American Corbiculadae,1865, very little work has been done on the group in this country other than by Dr. Victor Sterki. Dr. Sterki did a vast amount of work with these little clams including the naming of many new forms. Many conchologists have avoided this group because of their difficulties, while those collecting them have in most cases referred all material to Dr. Sterki for identification. The difficulty in positively identifying material of this group is indicated by the "?" which is frequently seen following the names on Dr. Sterki's labels. Dr. Sterki separated forms on minute distinctions and it is probable that when there is a more thorough knowledge of this group, many of Sterki's species will be reduced to subspecies or mere synonyms.

Following the death of Dr. Sterki, Dr. Stanley T. Brooks attempted to continue work on this group at the Carnegie Museum,Pittsburgh, where the Sterki collection is deposited. Dr. Brooks' time was divided between this and other duties and at the beginning of World War II he took up government work. At present he is continuing his work with the Technical Industrial Intelligence Division of the Department of Commerce and is located at Frankfurt,Germany. Obviously he is not at present available for consultation on our problems pertaining to the *Sphaeriidae*.

Rev. H.B. Herrington of Newburgh,Ontario,Canada, is now doing more active work on this group than anyone else on this continent. He has been very cooperative in helping us out with our *Sphaeriidae* of California and the western states. We are far from satisfied with our present state of knowledge of this group but we are making progress.

There are a number of forms which we have seen which do not seem to fit any of the described forms. I have omitted from our list, in most cases, such manuscript names as Pisidium harfordiana Prime, P. californicum Newcomb, P. berryi Sterki, P. greggi Sterki, P. elatum Sterki, etc.

For those interested in a detailed account of the anatomy of this group, the excellent work by Gilmore (1917, pp. 16-30) will be found very comprehensive.

Genus SPHAERIUM Scopoli,1777

" Shell thin, oval, more or less inflated; subequipartite, beaks subcentral;surface smooth or concentrically striate; teeth small, cardinals one in the right,two in the left valve;laterals double in the right, single in the left valve; nepionic shell passing into the adult without any distinct demarcation.

" Animal: Mantle open below,united posteriorly to form the siphons, and anteriorly and over the back; mantle edge with muscular ridge extending from the anterior to the posterior adductor muscle; siphons united at base but separated for their greater extent,smooth, without papillae or crenulations, the lower (branchial) siphon flat,large, with wide opening, the upper (anal) siphon rounded with small opening; when active the two siphons are directed away from each other;foot cylindrical, capable of considerable extension; gills four in number, the inner gill larger than the outer gill; outer lamella of the outer gill attached to the mantle lobes,inner lamella of the outer gill and the outer lamella of the inner gill attached to each other, inner lamella of the inner gill attached to the abdominal sac anteriorly and to its fellow posteriorly,forming a complete diaphragm;inner gills alone marsupial in character; palpi long, curved, narrow, connected at the base to each other and to the body surrounding the mouth." (Baker,1928,II, p. 312).

Type: Tellina cornea L.

Sphaerium simile (Say),1816 (equals S. sulcatum (Lam.),1818)
Nich. Encyc., 1st Amer. Ed. II, pl. I, fig.9

" Shell: Large, transversely oval,inflated,almost equipartite,rather solid; dorsal and ventral margins convex; anterior and posterior ends rounded, similar in shape; umbones depressed, inflated, placed a trifle forward of the center of the dorsal margin; beak markings of fine concentric ridges, followed by rather coarse concentric ridges; umbonal slopes rounded;surface shining,sculpture of heavy growth lines raised into rather evenly spaced ridges; color light to dark horn,chestnut in old specimens; scutum and scutellum well marked.

" Hinge strong,regularly curved; cardinals very small, a long elevated, arched tooth in the right valve and two teeth in the left valve, the upper long and arched, the lower tooth large, heavy,pyramidal; laterals double in the right, single in the left valve, short,lamellar,pyramidal,nearly straight; muscle scars and pallial line faintly impressed; nacre bluish-white ; cavity of beaks rather deep." (Baker, 1928,II, p. 314.)

Type Locality: Delaware River (similis), Lake George, N.Y. (sulcata)

Distribution: " East of the Rocky Mountains, rare in the South."(Sterki 1916, p. 431). " Very common in Mich., Wis., Ill., Ind., Ohio, Penna., and N.Y." (Baker,1928, p.315). " Found in Oregon and California" (Baily,1935, p. 75.). Henderson (June,1936, p. 252) lists Washington and Idaho records as based on Dr. Sterki's identifications. " North America generally south to Alabama,Arizona, and middle California." (Hannibal,Jan.,1912, p.21).

The only material I have seen which was referable to this species was from Lincoln Creek, Thurston County, Washington (Eyerdam); and Vashton Id., Puget Sound, Wash. (Berry collection). Those from Vashton Id. were identified by Dr. Sterki as S. sulcatum (Lam.).

Sphaerium striatinum (Lamarck),1818. An: sans Vert., V, p. 560,1818

" Elongate-oval,inequipartite,not much inflated;beaks placed anterior of the center of the dorsal margin,not much inflated,raised a trifle above dorsal margin,rather full,mammae-form; dorsal margin slightly arched;ventral margin broadly rounded, in some specimens almost straight; anterior and posterior ends roundly truncated, the posterior end usually more pointed and distinctly truncated; scutum and scutellum well marked; sculpture usually of rather feeble concentric ridges with fine lines between,but ridges on umbonal slope may be heavier in some specimens; color corneous,dark in some specimens and with dark spots or blotvhes on different parts of the shell; shell of medium thickness, sometimes rather thin.

" Hinge not very wide; cardinals small, that in the right valve curved, lower end swollen and sometimes bifid, with a deep pit beneath; upper cardinal of left valve small, straight or slightly curved; lower cardinal pyramidal, erect, of variable size; all cardinals are variable as to shape and size; laterals rather short, somewhat curved, extending considerably above the margin of the valve; the posterior laterals are longer and narrower than the anterior laterals; cavity of beaks deep; nacre purplish or bluish-white; the pallial line is very wide and irregularly serrated. L. 11.3; H. 8.8; D. 6.1 mm. L. 10.9; H. 8.1; D. 6.0 mm. L. 9.5; H. 7.6; D. 5.5 mm." (Baker, 1920,II, p. 334).

Type Locality: Lake George, N.Y.

Distribution: " East of the Rocky Mountains, The center of the distribution appears to be in the Middle States, Ohio,Michigan,Indiana, and Illinois. Typical or near-typical forms have not been seen from the South." (Sterki, 1916, p. 435). To the above Henderson (unpublished MSS.) adds " Mont.,Idaho, Utah,Colo., Calif.? and Nev.?; probably all incorrect." I have lots from four Oregon localities which appear to be of this form and identified by Rev. Herrington as S. striatinum but I have seen nothing of the kind from California.

Sphaerium nobile (Gould),1855. Boston Proc., V, 1855, p. 229; Otia Conchologica, p. 218. " T. magna, solica,ovato-rhomboidea,utrinque truncata sed postice obliquius; umbonibus antidis,tumidis; margine dorsali utrinque arcuatim declivibus; margino ventrali arcuato; valvis remote et profunde sulcatis; epidermide flavescente; dentibus cardinalibus minimis; intus pallida. Long. 1,2; lat. 1,4; alt. 3/8 poll. Found near San Pedro, California. Dr. Webb.

" Has a general resemblance to what is usually regarded as C. similis, but is more solid,more inequilateral, more obliquely truncated posteriorly, beaks more conspicuous, color paler, grooves coarser,cardinal teeth less developed. C. solidula Prime, must also nearly correspond in its characteristics." (Gould, Otia, p. 218).

" Animal not observed. Shell rhombic-ovate, inequilateral, moderately compressed; anterior margin truncated,posterior more distended, basal curved; beaks rounded, inclined toward the front, slightly tumid;separate at the apex; sulcations coarse;epidermis delicate,light brown; valves strong, interior white; hinge margin nearly straight,moderately broad; cardinal teeth single, distinct; lateral teeth moderately developed. Long. o.50; Lat. 0.37; Diam. 0.25 inches .

" Compared with S. sulcatum it is slighter, less sulcated, more compressed and less tumid." (Prime, 1865, p. 41.)

Type Locality: The locality as given by Gould is definitely incorrect. It is ironical that the genus Sphaerium is absent from the Recent molluscan fauna of Southern California.

Distribution: " California and Washington." (Sterki,1916, p. 437). This is incorrect as faras southern California is concerned, for the reason above stated. Where did Gould's specimens come from ?

Gould's description is quite definite,- " valvis remote et profunde sulcatis". He compares it with similis (sulcatum) and solidula, both deeply s sulcated and grooved forms. Prime apparently refers to the same thing and he compares nobile with sulcatum, though he states " less sulcated" while Gould " grooves coarser."

Later authors got definitely " off the beam". Roper compared it with S. dentatum, described as " sulcations slight". " It is a large, shining, dark brown shell, resembling Sph. dentatum Hald., but less inflated. The young shells are thin and smooth, while in S. dentatum they are more heavily striated than in the adult." (Roper,1896, p. 98).

Dall apparently followed Roper. " It closely resembles S. dentatum Hald. but is less inflated, while the young are smooth." (Dall,1905, p. 137). Obviously Roper and Dall refer to something entirely different from what Dr. Gould had in mind when he described S. nobile. In the Berry collection is a specimen from Seattle,Wash. which was identified by Dr. Sterki as S. nobile. It is a nearly smooth, but faintly sulcate form apparently belonging to S. californicum. This would indicate that Dr. Sterki held the same views as Roper and Dall. However, if we use the name Sphaerium nobile we are bound by the original description.

Sphaerium dentatum (Haldeman),1841. Proc. Acad. Nat. Sci. Phil. 1841, 100.

" Shell large, ventricose, somewhat equilateral, inferior and anterior margins rounded; posterior somewhat angular; beaks large, well rounded; posterior somewhat angular; beaks large, well rounded, distant, not very prominent; hinge margin nearly straight; cardinal teeth single, distinct; lateral teeth not prominent; sulcayions slight; eipdermis olive green, with a dark narrow zone at some distance above the basal margin.

" Long. o.50; Lat. o.40; Diam. 0.37 inches.

" The young shell is more elongated and more heavily sulcated than the adult; the beaks are less large and less tumid. This is a well marked species, compared with S. patella Gould, from the same section of the country, it is found to be larger, more ventricose, the beaks more inflated, and the color of the epidermis is different." (Prime, 1865, p.40).

Type Locality: Oregon.

Distribution: " Oregon,Washington" (Sterki,1916, p. 437)."California and Oregon. Spokane Falls, Washington." (Dall,1905,p. 137).

" Type, one immature specimen from Oregon, no definite locality"(Henderson

" Sterki says he does not know what dentatum is as the description in Mon. Corb. is meaningless." (Brooks, in letter to Herrington).

" It lives in lakes and streams in the Columbia,Klamath, and Nevada systems." (Hannibal,1911,-.305).

Sphaerium primeanum Clessin,1878. Malakozoologische Blätter, vol. 25, pp. 122-123, pl.V, figs. a,b.

" Concha grandis, angulato-ovata,aequilateralis,solida,modice inflata, irregulariter striata, nitida,castanea, antice ovata,rotundata,postice obtusata;umbones obtusi,prominuli; area et areola angulis obtusis circum--scripta; dentes cardinales valvae sinistrae 2; exterior tenuis, paullo curvatus, interior crassus,angulatus; val. dext. 1 angulatus,latere posteriore crassus,furcatus,latere anteriore tenuis,furcatus.

" Long. 16 mm; lat. 12 mm; diam. 9 mm. " Hab. Portland,Oregon

" Muschel: gross,winkelig-eiförmig ,gleichseitig,starkschalig,ziemlich aufgeblasen,unregelmässig gestreift,glänzend, von kastanienbrauner Farbe. nur die stumpfen,gerundeten,wenig hervortretrenden Wirbel fast olivengrunlich, vom Wirbel gegen die Rander laufen radiale Streifen; Verdertheil gerundet, Hintertheil abgestumpft; übrigenssind beide Extremitäten der Muschel seht ähnlich geformt,-- Oberrand etwas gebogen,gegen die Nebenränder durch die abgerundeten Ecken des deutlich markirten Schildes und Schildchens abgegrenzt; Vorderrand kurz,gewölbt, mit schönerRundung zum langen, wenig gewölbten Unterrand übergehend;Hinterrand kaum gebogen, mit dem Unterrande eine sehr abgerundate,stumpfe Ecko bildend. -- Innenseite: Perlmutter weisslich; Schlossleiste night seht breit; Ligament kurz,stark,überbaut; Linke Schale: Cardinalzähne 2; der Innere kurz, derb, einen Winkel mit fast gleichlangen Schenkeln bildend; der äussere kurz, fein, gebogen; Seitenzahne einfach, der vordere den Cardinalzähnen sehr genähert, stumpf und niedrig.--Rechte Schale: Cardinalzähn 1, im spitzen Winkel gebrochen,dossen hinterer Schenkel seht derb unc tief gefurcht ist,während der vordere sehr dünn ist scharg bleibt. Seitenzähne doppelt,niedrig,aber stark, die äusseren klein und stumpf.--

Ich have die Muschel,die ich der Gütedes Herrn v. Heimburn in Oldenburg verdanke,dem Specialforscher der Cycladeen, Herrn T. Prime in Newyork gewindmet.-- Sie ist durch ihre regelmässige Form vor allen behannten nord-amerikanischen Arten ausgezeichnet,--" (Clessin, 1878, p. 122-123).

" Shell large, equilateral, dark brown or black with lighter beaks, shining, outline rhomboidal, a little more elongated and the ends more rounded than Sph. rhomboideum Say, but the dorsal aspect very much like that of the species. The full, rounded beaks make the ventral section broadly cordate. One specimen,chestnut colored and with yellow border, is so close to Sph. rhomboideum as to be held in doubt." (Roper, 1898, p. 98).

Type Locality: Portland, Oregon.

Distribution: " Oregon, Washington. " (Sterki, 1916, p. 437). Material I have seen which was referable to this form was from the vicinity of Seattle (Randolph) and from Long Lake, Washington (Chace). I have not a s yet found any record of occurance in California.

Sphaerium californicum Clessin,1878. Malakozoologische Blätter, Vol. 25, pp 123-124, t.5, fig.2,1878.

" Concha mediocris, ovata, fere aequilateralis tenuis, valde inflata, subtiliter striata,corneo-fusca,antice angustata,rotundata,postice rotundata; umbones inflati,valde prominentes; margarita coerulescens; margo cardinalis angusta; dentes cardinales valvai sinistrae 2, exterior paullulum curvatus, interior fere semicircularis; valvae dextrae 1, forte curvatus, parte posteriore clavatus,furcatus; parte anteriore tenuis,extremitate paullo incrassatus. Long. 11 mm. lat. 8.5 mm. diam. 7 mm. Hab. California.

" Muschel von mittlerer Grösse, fast gleichseitig,eiformig,dunnschalig, aufgeblasen, fein gestreift, von hornbräunlicher Farbe mit dunkleren und gelblichem Rande; uber die Mitte der Murchel laufen dunkle Strahlen; Vordertheil wenig verkürzt,rundlich, Hintertheil gerundet; Wirbel breit,aufgeblasen, hervortretend; Oberrand etwas gebogen,nach den Nebenrändern nicht abgegrenzt; Schild und Schildchen kaum markirt; Vorderrand gerundet,ohne Grenze an den langen ziemlich,gewölbten Unterrand anschliessend; Hinterrand wenig gebogen. Ligament kurz, dünn; Innenseite: Perlmutter bläulich,Schlossleiste schmal; Linke Schale: Cardinalzähne 2; der Innere stark,fast halbkreisförmig gebogen, der Aeusere dünn, wenig gebogen; Seitenzähne ziemlich hoch,zugespitzt mit stumpfer Spitze; Rechte Schale: Cardinalzähn 1 fast rundlich, dessen hinterer

Schenkel stark, tief gefurcht; vorderer Schenkel dünn, an seinen Ende etwas verdickt. Seitenzähne doppelt, dünn; die Aeussere sehr niedrig.--"

" Auch diesse Murchel verdanke ich Herrn v. Heimburg. Sie gehört zur engeren Gruppe des Sph. corneum, weicht aber von allen nordamerikanischen Arten so sehr ab, dass ich eine neue Art in ihrerblicke, leider ist die nähere Bezeichnung ihres Fundortes night anzugeben."(Clessin,1878, p. 123).

Type Locality: California

Distribution:Northern California,Oregon and Washington. I have seen material from Seattle,Wash. (Berry); Lincoln Creek,Thurston Co.,Wash. (associated with S. sulcatum. Eyerdam); Johnson Creek, 11 miles east of Portland,Oregon (W.O.G.); Malheur Lake, Oregon (Willett); and the localities from Northern California listed below.

Distribution in California: From Northern California I have seen specimens from the following localities: Klamath River two miles above its junction with the Shasta River,Siskiyou Co. (Chace) and South Fork of Pit River,Modoc Co. (Willett).

Sphaerium patellum (Gould),1850. Boston Proc., III,1850, p. 292; Otia Conchologica p. 86.

" T. parva, tenuis, rotundato-ovalis ,lenticularis, modice cavata, concentrice exiliter sulcata,epidermide luteo-viridi induta; umbonibus medianis, rotundatus, haud elevatis; cardo dentibus duobus minutis cardinalibus instructus; dentibus lateralibus remotis,validis. Long. ½; alt. 3/8; lat. ¼ poll. Hab. Oregon.

" This is to be compared with C. cornea on account of the peculiar rounded form of the dorsal region, the umbones not raising so as to interfere with the general outline. The cavity of the beaks is still more shallow, the sulcations coarser, and the color yellowish rather than green, and on the whole the shell is more sense and larger." (Gould),

" Shell rounded oval, lenticular, compressed,equilateral; margins generally rounded; beaks central, small, hardly raised;valves slight,interior white; sulcations extremely fine; epidermis light, of a yellowish-brown color; cardinal teeth very diminutive, so placed as to assume the shape of the letter V reversed; lateral teeth not prominent, elongated. Long. 0.43; Lat. 0.31; Diam. 0.18 inches.

This species is peculiar, owing to its compressed oval shape and rounded beaks; compared with S. flavum it is more oval, more equilateral,and its beaks are less tumid." (Prime, 1865, p. 42).

Type Locality: Oregon

Distribution: " Northern California to British Columbia" (Sterki,1916,438)

Distribution in California: Keep (1904, p. 65) reports this species from Sonoma County.

Sphaerium occidentale Prime,1860. Proc. Acad. Nat. Sci. Phil.,1860, p.295.

" Suborbicular, inflated,fragile,nearly equipartite; all margins rounded; beaks large, rounded, raised from the shell in the form of a plate; scutum and scutellum not very well marked; surface with very fine lines of growth, with usually several rough concentric lines indicating rest periods; color horn or yellowish brown, with sometimes several lighter areas or zones.

" Hinge plate fragil. narrow; cardinal of right valve wide or narrow, curved a little or much, or sometimes straight, lower end always enlarged and of several shapes, in section acutely triangular (pyramidal) or more or less rounded; cardinals of left valve, upper rather long and narrow, thin, almost straight or much curved; lower cusp large,pyramidal,erect; laterals short, straight,pyramidal,compressed, not much, if any, raised above the margin of

the shell; cavity of the beaks rather deep; nacre purplish or corneous.
" Length, 6.1; height, 5.1; diam. 3.8 mm." (Baker,1928,II,p.347)

Type Locality: " Oswego and Greenwich, N.Y.; Columbus,Ohio." (Baker)

Distribution: "Widely distributed over the continent, but as yet of doubtful occurance in the southwestern states; apparently rare in the south" (Sterki,1916, p. 438).

" Mont., Wash., Oregon, Calif.,Nevada. All doubtful except Montana." (Henderson, unpublished mss.).

Genus MUSCULIUM Link.

" Shell thin,suborbicular or oblong, smooth, shining,striae very fine and delicate; beaks calyculate; cardinal teeth minute,often obsolete." (Walker, 1918, p. 87).

" Animal similar in general form to *Sphaerium.* Siphons united for the greater part of their length, capable of great extension; anal siphon with small,round opening,branchial siphon larger, with opening higher than wide. G Gills usually wider than in *Sphaerium,* not as much pointed,posteriorly,otherwise similar." (Baker,1928, p. 350).

Type: Tellina lacustris Müller.

Musculium truncatum (Linsley),1848. Am. Jour. Sci. VI, 1848, p. 234, fig.3.
" Shell: Rhombic-orbicular, thin, fragile,somewhat inflated, inequipartite, pellucid; dorsal margin nearly straight; ventral margin slightly convex; anterior end rounded, angled above; posterior end sharply,obliquely truncated; beaks well raised above the dorsal margin,calyculate; surface with many close-set, fine lines of growth; color light greenish horn; scutum and scutellum well marked.

" Hinge line but slightly curved, narrow, slight; cardinal of right valve heavy,anterior part thin, straight in some specimens,curved and enlarged in others; the lower part of the cusp is enlarged and often emarginate; there is a deep pit below the cusp; in section, the posterio-ventral part of the cardinal is higher than the antero-dorsal part; upper cardinal in the left valve long,narrow,high,slightly curved,and sometimes enlarged at the lower end; cardinal in lower part pyramidal,thick,erect; laterals rather long, straight,lamellar; cavity of beaks shallow; nacre light blue. L. 8.0; H. 6.5; D. 4.4 L. 700; H. 6.0; D. 3.8 mm. L. 6.5; H. 5.6; D. 4.1 mm." (Baker,1928,II, p. 356)

Type Locality: Connecticut.

Distribution: East of the Rocky Mountains, occuring most commonly from New York to Illinois; also Idaho,Washington,Utah,"and several records from California where Sterki suggests it may have been introduced (litt. to E.P. Chace).

Distribution in California: Yosemite Valley near village; Mariposa Co. (Chace); Lagoon 2 miles east of Laguna Service Station,Santa Rosa to Guerneyville road,Sonoma Co. (S.C. Field),material from both localities identified by Dr. Sterki. Lake Lagunita,south side of San Juan grade,Monterey Co. (A.G. Smith). Specimens from the Mojave River one mile below Victorville,San Bernardino Co. (Chace) were identical with specimens of *M. truncatum* from Ohio.

Some have questioned whether the California records should be referred to *M. lenticula* Gould. I have specimens of *M. lenticula* from Lagunita(Stanford) which were identified by Dr. Sterki. They are less sharply truncated at the posterior end and the anterior end is less evenly rounded. Described as *Cyclas truncata* Linsley.

Musculium lenticula (Gould MS) Prime,1865. Mon. Corb., 1865, p. 51.

" Shell rhombic-orbicular,lenticular,thin,pellucid, very slightly inflated, nearly equilateral; anterior side narrower; anterior margin curved; posterior margin abrupt; inferior rounded; beaks central,calyculate,approximate at apex; striae hardly visible;epidermis glossy, light greenish horn color; valves delicate,a little convex toward theregion of the umbones; interior light blue; hinge-margin nearly straight,narrow; cardinal teeth hardly visible,united at base,lateral teeth slight,narrow,not much elongated. Long. 0.43; Lat. 0.37; Diam. 0.18 in.

" Hab. North America in Carson and Klamath Rivers, California.

" This species, of which I obtained specimens from Dr. Gould, is so similar in nearly every respect to S. truncatum, that it is very difficult to tell them apart. The valves of S. lenticula are perhaps a little more convex as they approach the region of the beaks,and the hinge-margin a little more curved and less narrow. The young shell is of the same coloras the adult, whereas with S. truncatum, the young is of a lighter color." (Prime,1865,p.51)

Type Locality: " Carson and Klamath Rivers, California"

Distribution: Central California; north to Nanaimo,Vancouver Island, B.C.

Distribution in California: Carson and Klamath Rivers. Specimens which I have seen from Lagunita at Stanford (A.M. Strong) were identified by Dr. Sterki. This would indicate that Dr. Sterki considered it distinct from M. truncatum. Lakeside, Santa Clara Co. (Berry).

" At least part of the specimens ranged under this name appear to be M. lacustre Muller" (Sterki, 1916, p. 445). See note under M. steini (Schmidt) Described as Sphaerium lenticula (Gould MS) Prime.

Musculium partumeium (Say),1822. Jour. Acad. Nat. Sci. Phil. II,1822,p.380.

" Shell: Subquadrate or roundly ovate, thin,fragile,nearly equipartite, not much inflated; dorsal margin nearly straight; ventral margin slightly convex; anterior end rounded; posterior end truncated,roundly angled above, rounded below; the height is slightly greater posterior than anterior of the umbones; umbones elevated,calyculate; scutellum and scutum rather well marked; sculpture very fine,surface more or less shining; color light corneous or greenish-yellow. Hinge slightly curved, narrow,fragile; cardinal of right valve rather large, massive, anterior end straight,posterior end curved toward lower edge of hinge,enlarged but not emarginate at the end, a deep pit below the cusp; upper cardinal of left valve long, swollen and club-shaped at the posterior end; lower cardinal large, thick, pyramidal, erect; laterals long, almost straight, lamellar, erect; cavity of the beaks shallow; nacre bluish or whitish. L. 8.0; H. 6.9; D. 4.2 mm. L. 8.1; H. 7.0; D. 4.3 mm. Animal: The siphons are pink, the rest of the animal whitish or with a shade of pink." (Baker, 1928, II, p. 355).

Type Locality: Germantown, near Philadelphia, Pa.

Distribution: " East of the Rocky Mountains, commoner in the northeast." (Sterki, 1916, p. 441). Tehama County, California.(Hannibal, 1911, p. 305).

Distribution in California: Near Tehama,Tehama County, Calif.(Hannibal). Same locality cited by Baily (1935, p. 76).

" Partumeium resembles jayense. It is smaller, less inflated, the ends are more distinctly rounded, not as acutely truncated as in jayense, and the calyculate beaks are not as high. The cardinal teeth are also heavier and not emarginate." (Baker,1928, II, p. 356). Described as Cyclas partumeia Say.

Musculium steinii (A. Schmidt),1851. Zeitschrift für Malakozoologie, vol.7, pp. 118. " In einer Bivalve,welche mir Herr Stein von Weissensee bei Berlin als Cycl. calyculata sandte, erkenne ich eine neue Art., die mit so viel

Recht,als irgend eine andere,behauptet werden kann. Genau dieselbe Form fand Ich in Hr. Prof. Rossmässlers Sammlung aus der Hand des Freiherrn von Maltzahn aus Poitsch stammend. Sie wird sich also wohl nach öfter in Norddeutschland finden. Ihre Unterschiede von Cyclas calyculata Drap. und Pf. bestehen in Folgenden. Ihr Oberrand convergirt nach vorn stark gegen den Unterrand,während diese bei C. calyc. ziemlich paralell laufen;die Entfernungen eines von dem Wirbel auf die Basis gefällten Perpendikels vom Vorder- und Hinterrande verhal--ten sich bei C. calyc.- 1:1 1/3, bei C. Steinii - 1:2 1/3, (bei C. Creplini Dkr. - 1 1/4:1); die Knopfchen auf den Wirbeln, in denen sich die Gestalt der Embryonen erhalten hat. sind bei C. Steinii grösser als bei calyc.; ihr Hinterrand ist nicht so auffallend abgestutzt und fällt nicht so steil nach unter ab. als bei calyc.;der ganze obere Umriss beschreibt and meiner 4 Ex. fast einen (durch den weit vorspringenden Wirbel unterbrochenen) Halbkreis, dagagen bildet der gerade Oberrand von calyc. mit dem Vorder- und Hinterrande deutliche Winkel. Dimensionen nach Stein: Länge bis 7 ''',Breite 6 ''', Dicke 4½ '''." (A. Schmidt, 1851, p. 118)

Distribution: Palearctic and Nearctic. Includes records " from the Great Lakes, western Washington and British Columbia" formerly included under M. lacustre. " M. lacustre has not been found in North America ..." (Sterki,1928, p. 27). " California,Washington, and British Columbia" (Henderson, unpub. mss.) Described as Cyclas Steinii A. Schmidt.

Musculium raymondi (J.G. Cooper),1890. Proc. Cal. Acad. Sci. (2),III,1892, P. 74, pl.1, figs. 1-8.

" Adult shell ovate trigonal, nearly equilateral, much inflated, the greatest convexity near the middle,fragile,translucent; beaks central,slightly turned forward, very strongly calyculate; margins forming a subovate outline, the anterior obtusely rounded,posterior usually obliquely subtruncate; base curved equally with the hinge-margin, the edges of valves meeting at an angle of about 80 degrees, not flattened nor spreading laterally; the anterior very little lower than posterior, but slightly sharper. Divergence of upper margins from umbonal apex, 80 to 90 degrees. Color pale pearly-gray, sometimes irridescent,often with a narrow yellowish marginal band; epidermis tinged olive, wearing off in adult,surface smooth, shining; growth lines very faint, inside of shell white. Younger shell more oval, beaks less prominent, the calycles in shells not half grown being everted when seen from end of shell, instead of inverted. Fry oblong-oval, much compressed, its valves very dis--tinctly seen in calycles of adult. Soft parts yelowish, tinted with red, the colors visible through the shell. Length, 0.30 to 0.34 inch; height, 0.26 to 0.30; diameter, 0.16 to 0.21. Fry 0.05 to 0.06 long; o.04 to 0.05 high; 0 0.025 to 0.035 thick." (Cooper,1890,p.74)

Type Locality: Whidby Island,Puget Sound,Washington.

Distribution: California,Oregon,Wash. and British Columbia; east to Idaho, Utah and Colorado.

Distribution in California: " Streams between the Columbia and Klamath Rivers." (Baily,1934, p. 77) " Alpine region in the Sierra Nevada,Calif. to 8,700 feet" (Dall,1905, p. 138). " Found commonly in the swamp and rather rarely in the creek at Bluff Lake (San Bernardino Mts.)" (Berry,1908, 122) Trout Creek near south end of Lake Tahoe,El Dorado Co. (A.G. Smith).Lembert's Soda Springs,Tuolumne Meadows, Tuolumne Co. (Berry).

According to Cooper Musculium cooperianum (Prime MS) is probably the young of M. raymondi. (see Walker,1918, p. 188). It was listed as a new species but never described. Type locality, Johnson's Pass, El Dorado Co.

Musculium hanhami Sterki (ms?)

In Big Bear Lake, San Bernardino Mountains, San Bernardino County, there has appeared during the last few years a large conspicuous form of Musculium which is becoming more abundant. It is not listed in any of Dr. S.S. Berry's papers on the mollusca of that region and I suspect that it has been introduced during recent years as was Radix auricularia (Linne) (= Lymnaea auricularia) which is now the most abundant mollusk in that lake. This Musculium is much larger and very different from Musculium raymondi (Cooper) which is found but a few miles away in the swamp at Bluff Lake. Specimens of the Big Bear Lake form were identified by Dr. Stanley T. Brooks, then of the Carnegie Museum, as Musculium hanhami Sterki. At that time I very carelessly failed toask him for the reference to the publication of that name and for further data as to its distribution. Dr. Brooks is now in Germany and not available for cinsultation on this matter. I have had correspondence with several conchologists about this and it would appear from available information that this form has never had a published description. I mention it here merely because it is a conspicuous form frequently encountered by collectors at Big Bear Lake.

Genus PISIDIUM C. Pfeiffer,1821.

" Shell small, rounded, oval or obliquely cuneiform; inequipartite, the anterior side longer; beaks terminal; cardinal teeth situated under the beaks, one in right and two in left valve; laterals elongated, lamelliform, one in the left, two in the right valve; ligament on the short (posterior) side, internal.

" Animal similar in general structure to Sphaerium and Musculium. The foot is large for the size of the animal and is distinctly tongue-shaped, in some respects resembling that of Cardium; palpi elongated, triangular; gills rather broad; there is a complete diaphragm and the mantle is closed above. The greatest difference, which has been thought of subfamily rank, is in the siphonal openings, which are very different from any genus of the family. The anal siphon is small and directed either upward or straight behind; but there is no branchial siphon, the incurrent water entering directly from the outside through the mantle cleft beneath the anal siphon... Most authors in America have described the posterior openings as ' short,simple united to the end', but an examination of the posterior end of the living animal shows but one siphon (anal) and the currents of water entering the cleft of the mantle from which the foot is extended." (Baker,1928,II, p.364).

Type: Tellina amnica O.F. Müller.

Pisidium compressum Prime,1851. Proc. Bost. Soc. N.H. IV, 1851, p. 161.

" Shell solid, very oblique,trigonal,triangular,subseuilateral, very much drawn up in the region of the beaks,inflated in adult; anterior side a little longer,narrower,produced at the end,posterior broader,subtrunculate; beaks placed a little posteriorly, small,raised, with a wing-shaped appendage on the summits,distant;striae distinct, regular; epidermis very variable, yellow, gray, or chestnut color; valves solid,varying in inflation,interior light blue; hinge thick; cardinal teeth small, robust, compressed,disposed in the shape of the letter V reversed; lateral teeth distinct,short,strong, placed at an obtuse angle with the hinge proper." Long, 0.16; Lat, 0.14; Diam. 0.09 inches.

" P. compressum is more trigonal and less inflated than P. variabile; it is more equilateral than either P. virginicum,adamsi,or abditum, and more oblique and less equilateral than P. aequilaterale " (Prime,1865,p.64)

" Shell: Small,solid,inflated,very inequipartite,oblique,trigonal; anterior end rounded; posterior end roundly truncated; dorsal and ventral margins curved; scutum and scutellum not well marked;beaks elevated,compressed, placed near the posterior end, with well marked appendages,umbonal slopes rounded;surface shining, with well marked lines of growth; color yellowish, darker in older specimens. Hinge plate rather solid,wide; cardinal in right valve narrow, curved, slightly enlarged at both ends in some specimens, and in all at the lower posterior end near the base of the hinge plate; upper cardinal in left valve narrow,long,curved; lower cardinal very large,rounded, usually occupying the greater part of the cardinal area; the pits betweenand below the cardinals are very deep; laterals rather strong, elevated,somewhat curved,rather short; cavity of the beaks deep; nacre bluish,sometimes with a white zone bordering the valve." L. 3.5; D. 2.5 mm. L. 3.1; H. 3.0; D. 2.3 mm. (Baker, 1928, II, p. 370).

Type Locality: Massachusetts, in Fresh Pond, near Cambridge.

Distribution:" Distributed over the continent,more common in the East than in the West." (Sterki,1916, p. 447).

Distribution in California: Quite generally distributed over the entire state. Commonly found in mud around the roots of aquatic plants at the edge of streams. This is probably the most widely distributed of our California Pisidia.

We have specimens from the Los Angeles River and Rio Hondo localities and from an irrigation ditch near Downey.(Chace), Los Angeles Co.; Bishop and Owens River,Inyo Co. (A.M. Strong); Camp Rodgers, Plumas Co. (Chace); and Klamath River north of junction with Shasta at Hornbrook,Siskiyou Co. (T. Burch).

Pisidium neglectum Sterki,1906. Nautilus XX, p. 87.

" Mussel of small size, slightly to scarcely oblique,rather rounded in outlines,moderately to rather well inflated; superior margin slightly curved or nearly straight,with more or less marked angles where passihg into the anterior and posterior,supero-anterior slope generally marked,slightly curved, anterior end rounded angular,posterior part subtrunculate,inferior margin moderately curved; beaks slightly posterior,rather narrow, rounded, or somewhat flattened on top,moderately projecting over the superior margin; surface with fine, subregular to irregular,corowded,concentric striae, microscopically rugulose,dullish or somewhat shining; over the beaks there are much finer concentric striae to the center,and the surface is not rugulose,more shining; the color light to yellowish brown to whitish,shell translucent to rather opaque,tather thin; hinge rather slight, well formed,the plate comparatively broad; right cardinal tooth rather short, strongly curved,not reaching the lower edge of the plate,its posterior end much thicker,deeply grooved or bifid; there is an impressed groove between it and the edge of the plate; left anterior strongly curved to shapply angular and bent upward,the posterior oblique,curved; " lateral teeth" moderately stout, the outer onesof the right valve distinct, the anterior left cusp pointed, abrupt,the surfaces of all cusps rugulose; ligament rather strong. Long. 3, alt. 2.6, diam. 1.8 mm. types and average." (Sterki,1906, p.87).

Type Locality: Brook at Krumroy,Summit Co.,Ohio

Distribution: " East of the Rocky Mountains, apparently rare in the South " (Sterki,1916, p. 456). A single record from California has come to my attention.

Distribution in California: Specimens taken from Cottonwood Creek at the Kernville Road,Kern Co. were identified by Rev. Herrington.

Pisidium roperi Sterki,1898. Nautilus XII (7): 77

" Mussel rather large,strongly inflated when mature,very little so when young; oblong to ovoid in outline,margins regularly curved,with no projecting angles (in the adult); scutum and scutellum scarcely marked; beaks moderately posterior, very broad, surface somewhat glossy, with irregular not sharp,striae and some strongly marked lines of growth; color of the dry shell straw to yellowish-horn, often with one to several fine,concentric lines of purple; shell rather thin, nacre whitish, muscle insertions scarcely marked,hinge comparatively fine and short; cardinal teeth quite small, the right one moderately curved,slightly thickened at the posterior end; the left ones very short; the inferior slightly angular,truncated or pointed at the top, the superior sometimes almost obsolete; lateral teeth short, small, scarcely projecting into the interior; ligament rather fine. Long. 5.5, alt. 4.4, diam. 3.8(4) mill. Long. 4.5, alt. 3.7, diam. 3.0 mill.

" Soft parts pink, especially so the foot and mantle edges; the living mussel appears pale red; but the color soon fades away after the death of the animal; it is also very pale, scarcely noticeable in the young,becomming more intense with the age of the animal.

" Pis. roperi cannot be mistaken for any other species except some forms of P. abditum Hald., but is at once distinguished from the later species by its comparatively very broad beaks, the more elongated and more regular outline, the different appearance of its surface, usually the lighter color, the comparatively finer and shorter hinge, and in the living animal, by the pink color of the soft parts,shining through the shell. It is the only species in which that color has been noticed so far, yet it remains to ascertain whether this be a constant character. But, however, that may be, the species is valid. From several places specimens were obtained in company with P. abditum, and at once recognized as distinct." (Sterki,1898, p. 77).

Type Locality: Not goven

Distribution: " New England to Illinois,Minnesota,Ontario,Manitoba, Alberta,Montana". (Sterki,1916, 458) Colorado (Sterki,1923,22). California (Berry,1916, 39; Ferris,1917,34)

Distribution in California: Dry Lake, north slope of San Gorgonio Mountain, San Bernardino Co., altitude 9050 feet (Berry,1916, 39). Funston Meadows and Summit Meadow,Tulare County; and Onion Valley in Kearsarge Pass, Inyo Co. (Ferris,1917,34). Specimens from Mill Ranch Creek, Camp Rodgers, Plumas Co. (E.P. Chace) appear referable to this species.

Pisidium abditum Haldeman,1841. Proc. Acad. Nat. Sci. Phila. I, 1841,p.53

" Shell: Of good size, well inflated rather high, beaks slightly posterior, prominent but not much elevated,well rounded; scutum and scutellum well marked; dorsal margin rather long,curved; ventral margin broadly curved; anterior margin long, rounded, the end about midway of the margin; posterior end roundly truncated but without angles to the dorsal or ventral margins; surface finely irregularly striated, not polished, but shining; color corneous or grayish, rarely yellowish,often rosy or pinkish; shell moderately thick; nacre whitish. Hinge rather stout,plate wide; cardinal of right valve large,thick, usually curved, enlarged at the posterior end,where it may also be deeply cleft,emarginate,or simply rounded; the anterior end may also be enlarged; upper cardinal of left valve, large, thick,slightly curved,reaching to the base of the hinge plate; lower cardinal very thick,rounded,usually rather short; laterals small,short,not much elevated; cavity of beaks not very deep." L.3.0, H. 2.4; D. 1.9 mm. L. 3.1; H. 2,9; D. 2.0 mm.

" This species is very variable, and, as remarked by Sterki, has been made a dumping ground for any unknown form of the genus. The types were recently examined by Sterki and found to be of a characteristic species,somewhat different from the figures and description of Prime, who included too many species in the synonymy. The general rounded or rounded-oval form with the depressed beaks and the rather heavy hinge teeth (cardinal) will help to distinguish this variable species." (Baker,1928,p. 406).

Type Locality: Lancaster Co., Pa.

Distribution: " East of the Rocky Mountains; common in the Northeast; apparently scarce west of Ohio; not seen from the Southwest and the Gulf states." (Sterki, 1916, p. 459). Henderson (1924, p. 93) lists Idaho,Utah, Montana, and Colorado records. Rev. H.B. Herrington believes that such material from Oregon and Washington should be refered to P. abditum ; though much of it is not typical abditum it should be considered as a form of abditum. Two lots from California approach very close to typical abditum.

Distribution in California: Specimens collected by E.P. Chace from " " Mudhole, edge of Patrick's Creek, 2 miles above Patrick's Tavern, Smith " River Highway, Del Norte Co.. Of these Herrington remarked" These shells are so near to Sterki's 6971,Duxbury,Mass. (except in heaviness of striae) that I see no reason for not calling them just plainly P. abditum Hald." On specimens from Meadow below Firwood Camp,Sequoia National Park, Tulare Co. (E.M. Chace) Herrington reported " I am inclined to call this just plain abditum. If not it is very close to what I so understand." From the following localities, Rev. Herrington identified material as Pisidium abditum Haldeman,a form. They are forms closely related to the eastern form of P. abditum but not typical: Wilson Creek, south of Crescent City,Del Norte Co.,Calif. (Chace); Trout Creek, south end of Lake Tahoe,El Dorado Co. (A.G. Smith); Grassy Lake, Lake Center Basin,Plumas Co. (Smith); Panorama Camp,Greenhorn Mts., Kern Co. (Walton and Gregg); Grapevile Creek, 2.7 miles north of Fort Tejon,Kern Co.; near La Loma Road and Laguna Rd.,Pasadena; Swamp near Ballona Creek south of West Adams Blvd.,Los Angeles (Chace) Los Angeles River, North Hollywood localities; pools, Grifffith Park Bird Sanctuary, Los Angeles; Santa Clara Creek, Soledad Canyon, Los Angeles Co.; marsh along Mojave River, one mile north of Victorville, San Bernardino Co.,; Palomar Mt. and Pine Creek in San Diego Co.

Pisidium abditum huachucanum Pilsbry and Ferris,1906. Proc. Acad. Nat. Sci. Phila.,1906, p. 173.

" The shell is quite inflated, dark brownish-olive, irregularly striate and marked with several conspicuous dark growth-arrest streaks; very inequilateral, the beaks low and near the anterior end. Anterior end abruptly truncate,posterior end produced and rounded. Hinge rather narrow, the lateral teeth in the right valve single,short and high,triangular; in the left double. Length 5.1, alt. 4.3, diam. 3.4 mm." " About half the shells are more compressed than those described as typical, one measuring , length 4.1, alt. 3.4, diam. 2 mm. The very inequilateral, anteriorly truncate outline and the low beaks are characteristic of both the obese and the compressed forms." (Pilsbry and Ferris, 1906, p. 173).

Type Locality: Stream in Carr Canyon,Reef, Cochise Co., Arizona

Distribution: " Arizona,Nevada," (Sterki,1916, p. 467).Henderson (1924, p. 94) lists Colorado and Utah localities but questions previously published Idaho record. One possible record from Calif.

Distribution in California: In the Berry collection there are specimens from Witch Creek, San Diego Co., which Dr. Sterki identified as Pisidium (cf) huachucanum P. & F. Sterki says, " not a form of abditum ; apparently nearer occidentale" while other authors believe that occidentale is only a subspecies or form of abditum.

Pisidium subrotundum Sterki,1906. Nautilus XX (2):19

" Mussel small, moderately and regularly to rather well inflated; outlines rather oval to short oblong to nearly circular;superior margin straight or nearly so, as especially noticeable in younger specimens; beaks slightly posterior, rather broad (in most forms), moderately projecting over the hinge margin, thus completing the round outlines, except for the slightly projecting angles at the scutum and scutellum; surface with very fine, subregular to irregular striae and usually a few well marked lines of growth,dullish to somewhat shining; color horn or light amber to straw to whitish; shell translucent(in the horn colored) to opaque (in the light colored specimens), thin; hinge slight and teeth small; ligament rather short and slight. Long. 3.2, alt. 2.7, diam. 1.8 (100: 84.4:56.3) average. " (Sterki, 1906, 19)

Type Locality: Albany River,Ontario; Isle Royal,Michigan.

Distribution: " New England and New York to Ohio, Indiana,Ontario,Mich., Minn., Specimens from Montana (Pacific drainage) and Oregon appear to be identical." (Sterki, 1916, p. 459). " Lakeside, north of Coos Bay, Oregon" (Henderson, 1929, p. 70). " Calif., Ore., Mont., Wash." (Henderson, unpub. ms.

Distribution in California: No data has been available other than Henderson's unpublished record.

" Near *P. abditum*, but is probably distinct... *P. subrotundum* is generally more northern and appears to be more ancient." (Sterki, 1916, p. 459). " The shell is rounder and less inflated than *abditum*, and the cardinal teeth are very different,much more delicate... The fact that it inhabits both shallow pools and deep lakes is of interest,indicating a wide range of ecological characteristics." (Baker,1928,II, p. 409).

Pisidium rotundatum Prime,1851. Proc. Bost. Soc. N.H. IV,1851, p. 164.

" Shell small,rounded-oval,globose,ventricose,inflated,subequilateral; anterior and basal margins rounded,posterior margin somewhat abrupt; anterior side a little longer; beaks nearly central, very large, prominent , rounded; surface glossy, yellow, somewhat darker in the region of the beaks; hinge-margin curved; teeth small. Long. 0.09; Lat. 0.07; Diam. 0.08 inches (Prime 1865, p. 72)

Type Locality: " North America in the region of Lake Superior" (Prime)

Distribution:" New England and New York, to Ontario,Ohio, Minn.,Manitoba, Montana (Pacific drainage). It seems to occur also in Europe." (Sterki, 1916, p. 465). Sterki (1923,22) and Henderson (1924,97) list Colorado localities. Two California localities have been recorded.

Distribution in California: Specimens taken from the swamp at Bluff Lake and in the Lower end of Bear Lake, San Bernardino Mts., San Bernardino Co., were identified by Dr. Sterki (S.S. Berry).

Pisidium rowelli Sterki,1903. Nautilus 17 (7):80

" Mussel well inflated, elliptical-ovate in outline, angles at scutum and scutellum slightly projecting, broadly rounded; posterior margin just perceptibly subtruncate, supero-anterior slope slightly marked; beaks a little posterior (in normal position) large,rounded, projecting over the hinge margin; surface shining, slightly and irregularly striate, with a few coarser lines of growth; horn colored to brownish over the beaks, usually with a lighter zone along the margins, not sharply defined; shell translucent, rather thin; hinge slight, plate rather narrow; right cardinal tooth angular, with its posterior part thicker and groovedm left anterior short, triangular, placed high up on the plate,the posterior much longer,oblique,curved; lateral teeth with rather short, abrupt cusps in the left valve; the outer ones in the right valve small; ligament slight. Long. 7.5,alt. 6.2, diam. 4.5 mill." (Sterki, 1903, p. 80)

Type Locality: Near Sisson, at the foot of Mount Shasta, Calif.

Distribution: California

Distribution in California: Onion Valley in Kearsarge Pass, Inyo Co. (Ferris,1917, p. 34); Mariposa Grove,Yosemite National Park, Mariposa Co. (E.P. Chace: identified by Sterki); Ice-cold spring at Polaris,Nevada Co. (Berry collection); Strawberry Creek near Idyllwyld,San Jacinto Mts.,Riverside Co. (G. Kanakoff, identified by Herrington); neat Sisson at foot of Mount Shasta,Siskiyou Co. (Rowell); Funston Meadows,Silliman and Panther Creeks, Tulare Co. (Ferris).

" This large and beautiful Pisidium cannot be mistaken for any other species. It seems to be related to abditum Hald., and some of the old-world Pisidia. Young specimens are very little inflated, and of a light, almost whitish color." (Sterki, p. 81)1903). Rev. Herrington considers this a subspecies of P. abditum.

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The fresh water report will be continued in our next issue.

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News From and About Collectors

During the war it was a source of amusement to me to find that the censors cut these Minutes to ribbons on occasions. Dr. James Zetek of the Canal Zone recently wrote " Your Minutes came and did not come, during the war, and most of those that did reach me during the war were badly cut up by the censors, as if the mention of fathoms and such data would give someone valuable information."

Certainly nothing was ever reported in the Minutes that was not the public knowledge of any ebemies we might have had at the time, so obviously the idea was to make our communications a bit more confusing. I am reminded of the famous libel suit said to have been brought by Pop Warner, the famous football coach against seome writer who said that the fundamentals of the Warner system was to pass the ball around so much that nobody knew who had it except the other side.

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Dr. James Zetek, Canal Zone Biological Area, (Formerly Barro Colorado Island Biological Laboratory)- Drawer C, Balboa, Canal Zone. " I am still much beyond my gills in work and I see no indications of a let-up, on the contrary, the Canal Zone Biological Area is demanding much more of my time. And since this is all " extra" to my U.S.D.A. duties and research, all I can do is hope and pray.

The quality of the work you are doing on mollusks is outstanding, and the " Minutes" are just brim-full of most valuable data. How I wish we could just transplant a few, at least, of the very many splendid workers you have in your area. I can't even get a stenographer that is worth much when it comes to scientific matters, and a technical assistant is out of the question And now with the wave of economy in the government, God only knows how we will fare. .... During the war we were of course too busy for comfort; we had our regular research work in entomology, but on top of it we have very much more of problems vital to the war effort, and these covered everything. We had a lot of professionals busy with problems of corrosion, deterioration, fungi, etc., and unfortunately my thirty-six years in scientific work here gave me no chance to plead ignorance, or to hide. ..Fortunately I was able to keep Barro Colorado Island free of all intrusion by army or navy, no guns, no radar, no nothing. It was a place of much activity, and it is now better than ever. I only hope that Congress will loosen up with more funds, because it has been very hard for me to " find" the money needed to keep the place going. The administration burden has been very heavy. And of course, very little time for personal matters, or to prepare manuscript."

José A. Freire, Heredia 305, Santiago de Cuba, Cuba. " By the Minutes I read about all the nice collecting done by the fellow members all over the world and believe me sometimes I envy them. We have nice collecting grounds here. too and we have collected very good species in Santiago de Cuba harbor, especially at the entrance of Nispero Cove. Just yesterday my friend Alayo and I went there collecting and had exceptional good luck. But I had better begin with the beginning in case you are interested. We left Santiago in the morning in a bus to Ciudamar. Ciudamar is a residential section of Santiago de Cuba perched ontop of a hill just at the entrance ofthe bay, overlooking the Morro Castle, Socapa, Cayo Smith, Punta Gorda, etc. all beautiful places in our harbor.

When we arrived there, we went down a steep little hill under a thick canopy of "aroma" (Acasia farnesiana, Wild) wet yet from the morning dew, amid beautiful butterflies of vivid colors (Achitonia charitonia charitonia: jet black with lemon yellow stripes; Dione vanilla insularis: bright reddish orange with bright silver spots, disturbed fromtheir morning slumber, to a small beach about fifty feet long at the entrance of Nispero Cove, which is in reality, another bay full of little coves.

On this beach, we stripped off our clothes , leaving on only our bathing trunks (the morning was cool and sunny) and put on our alpargatas (canvas shoes with rope soles) and started wading towards the Nispero Cove collecting on the very rough littoral full of rocks and covered with hundreds of black sea urchins of brittle and poisonous spines. Even though we are used to walking in this spot and we are very careful, we get some spines in our feet.. theyare so numerous.

This littoral is formed by a narrow shelf of 5 to 12 feet wide between the wall of the vertical hill and the almost vertical drop of the sea bottom which in a couple of horizontal feet, drops to 15 or 20 fathoms. Right here, on this incline (where the bottom starts to drop) we collect our specimens.

This " veril" (incline) is full of live corals and thousands of rocks of all shapes and sizes, under which live large colonies of Arca, Chama, Pinctada Pedalion, Fissurella: we also find large Aplysias (sea hares which when disturbed discharge a liquid that turns the water a beautiful purple color), Octopus, lobsters etc.

The place bristles with Pinna carnea Gml. giving the place the appearance of a thousand mouths gaping at us; and colorful reef fish play among the rocks, for instance: the pinkish gray cuberetas (Mangrove snappers), yellow striped cajies (yellow snappers), the red, voracious carajuelos (squirrel fish); yellow, red mouthed roncos (grunts); the majestic yellow and blue verracos (queen trigger fish), blue or yellow barberos (surgeon fish); so annoying when one is fishing; the silvery mojarritas (little shads); jet black negritos and yellow and black striped Isabelitas which nip at one's legs, frisky halfbeaks, schools of playful minows and small, but not less savage picudas (barracudas).

This place, though rough, is peaceful, with that peace you find only in nature; I should better say, with that peace lovers of nature find where other people, maybe more sophisticated or bitter, find only discomfort.. you see, there are no bathing beauties in the nook of the cove.

While we are collecting, we are unconsciously listening to the melodious song of the sinsontes (mocking birds) which should be our national bird- theyare so numerous; the soft whistling of the senserenicos and viuditos and the silly chirping of the bobitos and cartacubas (this last one a beautiful, tame little king fisher dressed in white, greenand red, which sing to us from the spiny coastal vegetation that covers the mountain side.

(con.)

In about three hours of collecting, we found the following species:

Fasciolaria tulipa L.
Vasum muricatum Born
Leucozonia cingulifera Lam.
Murex brevifrons Lam.
Cantharus auritula Lam.
Sistrum nodulosum Ad.
Planaxis nucleus Wood
Planaxis lineatus Da Costa
Cerithium literatum Born
Nassarius vibex Sby.
Dentalium sp.
Strombus gigas L.
Strombus sp.
Mitra nodulosa Gmelin
Mitra sp.
Livona pica L.
Modulus modulus L.
Turbo castaneus
Polinices brunneus
Nerita tessellata Gmelin
Nerita versicolor Gmelin
Neritina viridis
Littorina angulifera Lam.
Littorina ziczac Gmel.
Testarius muricatus L.
Echinella nodulosa Wood
Acanthopleura granulata Gmel.
Chiton marmoratus
Chiton sp. 2
Subemarginula octoradiata Gmel.
Acmaea cubensis
Diadora listeri d'Orb.
Acmaea punctulata Gmel.
Fissurella sp.
Pedalion alatus Gmel.
Meleagrina (Pinctada) radiata Lam.
Pedalion chemnitzianus Orb.
Mytilus exustus L.
Lithophaga nigra Lister
Pinna carnea Gmel.
Chama congregata
Lima scabra Born
Arca barbadensis Pet.
Arca umbonata Lam.
Arca adamsii Shutl.
Arca zebra Swain.
Arca candida Chemn.
Codakia orbicularis L.
Lucina jamaicensis Lam.
Asaphis deflorata L.

When we noticed that time was flying and that it was getting late, we dressed and again went up through the little acasia woods again and up the road to wait for the bus, in the meantime, we collected land species like: Thysanophora euclasta, Macroceramus pictus, Parachondria (Parachondria) texta texta, Helicina exerta and many interesting fossils from the mountain side.

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Mr. and Mrs. E.P. Baker, Downey, Calif. " Sorry we have missed last several meetings of the club. Irene and I were down on the Gulf- Sonora, Mexico in Jan.-, spent several days collecting and came home with some nice shells. Had a grand time. More of that later. When we should have been dressing and getting ready for the Jan. meeting we were still climbing round over the rocks at Pt. Firmin (- 1.9 tide) collecting Cypraeas , Some nice ones, I'll say.

Kenneth B. Disher, The Cleveland Museum of Natural History, 2717 Euclid Ave., Cleveland 15, Ohio. The former address was Allegheny State Park, Red-house, N.Y.

Mr. and Mrs. Ralph Bormann Jr., 2400 Termino Ave., Long Beach, Calif. This is the new address and we are glad to have them back home with us again.

Dr. Karl L. Pfeiffer, Kassel-W, Rammelsberg, Germany. I am also quite willing to exchange land and freshwater shells and mussels with the members of your club and to buy them from them, but all that will only be possible, when a regular intercourse between Germans and Americans can take place again.

Dr. Hans Friedrich, Munchen 8, Schneckenburgstr. 15/1, Germany. We were pleased to have an interesting letter from Dr. Friedrich telling of the almost unbelievable difficulties in the way of communications in Germany now. Apparently all we can send in the way of mail is either a parcel with declaration or first class mail.

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* Note*- In the campus parlance of one of the younger but serious students, this work is ' Super' for mollusks.

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Orders for the above publications will be given prompt attention when sent to John Q. Burch, 4206 Halldale Ave., Los Angeles 37, Calif.

DIRECTORY OF CONCHOLOGISTS

The directory has been delivered. The plan is to publish a corrected edition annually and it is hoped that the errors in this list will all be corrected and the host of interested persons omitted from this issue will be included in the 1948 edition.

If this directory has not been sent you it will be mailed on approval to anyone interested. Price $1.50.

Additional names and information continues to come in. These names will hereafter be listed for the 1948 issue. A few of those too late to be included follow:

Alayo, Pastor- National City Bank,Santiago de Cuba,Cuba. 1,4,9,10,11
Bloemfontein Museum,Bloemfontein,Orange Free State, South Africa
Dolley, Dr. Charles- Nassau, Bahamas
Ford, Rev. Paul D.- Box 924, Nassau, Bahamas- 1,4,8,11
Griffin, Wm. E.- P.O. Box 274, Nassau, Bahamas
Hoepfen, Dr. van- Bloenfontein Museum, Orange Free State, South Africa
von Kimacowicz, Richard- Sibiu (Roumania) Stejeri 7
Instituto E. Museo Di Zoologia, Della R. Universita Di Torino, Via Accademia Albertina,17, Torino,Italy
Johns, Bryn- Nassau, Bahamas
Sorentsen,A.L.- Nassau, Bahamas
Vernay, Arthur- Nassau, Bahamas
Viglino, Pompeo- 26 Corso Peschiera,Corina,Italy 1,4,5,8,12
Zoologische Staatssammlung, (13b) Munchen,Germany

Bethea, Rev. James E.- Robert E. Lee Memorial Church,Lexington, Va. 1,6,8
Bowdoin College,Brunswick, Maine
Carls, Erwin W.- Star Route, Box 53, Wrightwood, Calif. 1,2,3,4,5,6,7
Goodell, Mrs. Charlotte H.- 1532 3rd Ave., Bradenton, Fla.
Hartsock, R.L.- 2151 E. 24th St.,Oakland 6, Calif.
Johnson, Mrs. R.- 278 Santa Clara St.,Ventura, Calif.
Kinion, Mrs. W.L.- 200 S. Edwards, McPherson,Kansas
Moore, Mrs. Leonard- 3054 West 46th St., Cleveland,Ohio
Roberts, W.L.- Rise Bldg., Rapid City, South Dakota
Stokes, H. Ernest Jr.- 1507 Home Ave., Hartsville, S.C.
Thurston, Marie H.- 614 Park Ave., Laguna Beach, Calif.
Walters, Mrs. Mable- 29216 Orchard Lake Rd.,Farmington,Mich.
Zetek, Dr. James- Drawer C, Balboa,Canal Zone- 2,3,4,5,8,9

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* * *

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MINUTES 70 JUNE,1947
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We are now meeting the first tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, California. All interested persons are cordially invited.

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We wish again to urge all who have not made reservations for the meeting of the American Malacological Union at Pacific Grove, June 18 to June 21 to do so at once. Write Mr. A. Sorensen, 247 Granite St.,Pacific Grove, Calif.

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An Addition to the Molluscan Fauna of California

By Dr. A. Myra Keen " By chance this week I came on the fact that we have overlooked one of Mr. Strong's species, ?Liotia acuticostata supranodosa Strong (Trans. San Diego Soc. Nat. Hist., vol. 7, no. 37, p. 438, pl.30, figs. 4--6). The holotype came from San Diego. I accidentally omitted the name from the Abridged Check List, and I note that in the Minutes (no. 57, p. 25) you gave the range as Gulf of California and the date as 1933. In 1940 Dr. Willis G. Hewatt collected material that I identified as this form from Santa Cruz Island. Opercula in two specimens indicate that it is not a Liotia but, as Mr. Strong half suspected, a Homalopoma. It should therefore be recorded as Homalopoma supranodosum (Strong), with a range from Santa Cruz Island to San Diego."

* Note* Those using the Burch numbered Check List will give this species the number 1700.1

Purpura and Thais

By Dr. A. Myra Keen. " I have been reviewing Mr. Clench's paper " The genera Purrura and Thais in the Western Atlantic", Johnsonia, vol.2, no.23, March, 1947. Acceptance of the arguments offefed therein will necessitate some nomenclatural changes in our list, but I believe it will be in the interests of nomenclatural stability to make these changes, as Mr. Clench's decisions all seem to be based upon sound premises and observations. Our revised list, would be, then:

Genus Purpura Bruguiere,1789. Type (subsequent designation, Montfort,1810) Buccinum persicum Linne.
Purpura patula pansa (Gould)
P. columellaris Lamarck
Genus Thais Röding Type (subsequent designation, Iredale,1915), Thais lena Röding - Murex fucus Gmelin - Nerita nodosa Linne.
(N.B.: M. fucus is erroneously recorded as M. fuscus by Clench, pp.68-69
Thais (Thais) callaoensis Gray
T. (T) triserialis Blainville
T. (T) planospira Lamarck
Subgenus Thaisella Clench,1947. Type (o.d.), Purpura trinitatensis Guppy.
Thais (Thaisella) kiosquiformis Duclos
Subgenus Stramonita Schumacher,1817. Type (s.d., Gray,1847),Buccinum haemostoma Linné.
Thais (Stramonita) biserialis (Blainville) (I cannot follow Mr. Clench in subordinating this under T. haemostoma, as the large suite of comparative material in the Stanford Collection indicates several clear distinctions in sculpture and color.
T. (S.) chocolata (Duclos)
T. (S.) delessertiana D'Orbigny
T. (S.) peruensis Dall
Subgenus Mancinella Link,1807. Type (s.d., Iredale,1915), Murex mancinella of authors, not of Linné,- Purpura gemmulata Lamarck
Thais (Mancinella) crasa (Blainville)
T.(M.) triangularis (Blainville)
Subgenus Polytropa Swainson,1840. Type (s.d. Herrmannsen,March,1847): Buccinum lapillus Linné. (This has priority over the designation of Gray, Nov.,1847- fortunately of the same species.)
Thais (Polytropa) emarginata (Deshayes)
T. (P) lamellosa (Gmelin)
T. (P.) lima (Gmelin)

Accepting Mr. Clench's conclusions as to the genotype of Thais (and I must interpolate that there is room-- though slight -- for argument), we are obliged to emend our statement of the genotype of Drupa. This was erroneous, anyway (Minutes, no. 52, p. 10), either through a lapsus calami on my part or an error of transcription on yours. The type of Drupa was not by monotypy but by subsequent designation of Suter,1913: Drupa morum Röding. It is Nerita nodosa Linné only in part, and if that name is to be retained for the type of Thais, then the first available name for the other entity contained in Linnaeus' composite species will be Drupa morum Roding, better known under the later name of Ricinula horrida Lamarck. "

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* Note* - Those using the Burch Check Lists will on page 15 change the generic name on numbers 925-938 from Purpura to Thais.

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Dr. Bengt Hubendick, Zoologiska Institutionen,Uppsala,Sweden ",.... wish alcoholic material of Plesiophysa. The species of this genus occur in the West Indies and perhaps on Bermuda. As I am working with the comparative anatomy of Bosommatophores, it should be extremely interesting for me to investigate Plesiophysa."

Publications Received

" A Surprising Molluscan Discovery in Death Valley" by S. Stillman Berry, Leaflets in Malacology, vol.1, no.2, May 3,1947.

The discovery of an Assiminea (A. infima n. sp.) in the salty pools of the Death Valley desert is of great interest. These shells have been collected and discussed for several years but no one seemed to be able to allocate them to their proper genus. Dr. Berry's paper is very thorough and of great interest.

" New Genera and Species of Synceridae from Panope, Caroline Islands" by William J. Clench, Occasional Papers of the Bernice P. Bishop Museum, Honolulu, Hawaii, vol. XVIII, no.13, June 12,1946.

It seems fitting to mention this comparatively recent paper following the one above because the shells figured by Dr. Clench seem to be so radiacally different both in outline and in the opercula. There is an excellent figure of the radula of Thaanumella angulosa. Dr. Berry did not include a figure of the radula of his new species but obviously made a careful study of it because of the detailed description.

" Dispersal of Shipworms among Central Pacific Islands, with Descriptions of New Species" by Charles Howard Edmondson, Occasional Papers of the Bernice P. Bishop Museum, vol. XVIII, no. 15, Aug.7,1946.

" Diacolax cucumariae n. gen. , n. sp.- A new parasitic snail" by G. Mandahl-barth, Vidensk. Medd. fra Dansk naturh. Foren. Bd. 109,1946.
and
" Thyonicola mortenseni n. gen., n. sp." - Bd. 104, 1941.

Mr. Mandahl-Barth's studies of the parasitic mollusks is of considerable interest because of the fact that further study will without a doubt reveal similar forms in the fauna of this coast and others.

" Landand Freshwater Mollusca" by G. Mandahl-Barth, reprinted from " The Zoology of Iceland" 1938.

" Revista De La Sociedad Malacologica " Carlos De La Torre ", vol.5, no.1, April 15,1947, Havana, Cuba. This is an unusually interesting issue of their excellent periodical. A new subspecies of Strombus costatus is described by Miguel L. Jaume and Alejandro del Valle and a new species of Conus (C. havenensis) is described by Carlos G. Aguayo and Isabel P. Farfante. An item of some interest is the republication of " The West Indian Marine Shells" by Henry Krebs (by W.J. Clench, C.G. Aguayo and R.D. Turner).

" Basteria", the publication of the Netherlands Malacological Society is an excellent periodical containing a surprising number of papers in English. We have a complete file now of this work and find frequent occasion to refer to it.

" Revision Des Especies De Pisidium" by Jules Favre, Revue Suisse De Zoologie, Geneva, Switzerland 1943. In 64 pages and with many figures this work should be of value to all students of this group.

" Revised Catalogue of the Testaceous Mollusca of Mauritius and its Depenencies"- Mauritius Institute Bulletin vol. 1, part 2, Jan. 1937. This work is not new but it is a check list of species which should be invaluable to all students concerned with the fauna of the Indian Ocean.

" The Nonmarine Mollusks of San Jose Island, With Notes on Those of Pedro Gonzalez Island, Pearl Islands, Panama" by J.P.E. Morrison, Smithsonian Miscellaneous Collections, vol. 106, no.6 49 pages and 3 plates. Sept.12,1946

News Items

Professor Trevor Kincaid, University of Washington, Seattle 5, Wash. " ...I have been in partial retirement from teaching during the last three years, but this fall I go on a pension. This also takes me off the staff of the Oceanographical Laboratories which are now in process of reorganization. The navy is giving the laboratory a boat which will be capable of operating in the open sea. However, my gum boots are still in "good working order."

H. Carroll Mc Gowan, 603 N. Alisos St., Santa Barbara, Calif. Phone 24623. Note the new address. Our member has purchased a new home and has room for his shell collection to expand ... " Would be happy to see you or any of my shell collecting friends when in Santa Barbara. Please look me up if only for a moment... Margaretand the two little boys are doing fine. The youngest will soon be talking and walking. Soon hope to have two fine energetic shell collecting assistants."

Mrs. G.W. Hazlewood, 102 S.W. 5th Ave., Mineral Wells, Texas. " ... From the names in your directory of Texas people I am writing to ask them to get together to exhibit and learn from each other ..."

Morris K. Jacobson- address after July 1 will be Box 162, Rockaway, N.Y. Big plans for the summer ..."

R.D. McCurdy, Broadus, Montana. Your editor is herewith sending out an S.O.S. to our land snail collectors. He inadvertantly made the statement that there are land snails to be had everywhere in the U.S. if you know where and how to find them, but am not too sure about that now---" You said there were land snails in Montana. We live in the southeastern corner- semi-arid and I have been a nature student all my life, and nearly forty of that here. I have never found any and I immagine there are some here if I knew when and how to look for them. We are planning a trip in July to the Yellowstone Park and points in western Montana in the mountains. Could you give me any hints as to how and when to look for them. I'll do my best to try to find something you might be interested in. I know much of my time will be spent " close to nature" so if I have some hint as to how to look I'll certainly do my best."

Mrs. Ruth Paulus, Rt. 1, Box 281, Sahta Cruz, Calif. The former address was in San Jose.

Mrs. E.W. Boerstler,Box 494, Corona del Mar, Calif. In the Directory the number 7 was placed after Mrs. Boerstler's name. This was in error because while she collectes extensively and exchanges she does not sell shells.

Mrs. Hattie Gemmell, 1304 Magnolia Ave.,San Jose, Calif. We were somewhat amazed to hear that Mrs. Gemmell had sold her beautiful collection to Mr. A. Sorensen of Pacific Grove, Calif. " ... I shall always be interested in shells and shall always love to look at other collections but I am through with having a collection just to look at by myself." Well the only editorial comment here would be this- the two best private collections in *Haliotis* were formerly Mrs. Gemmel's and Mr. Sorensen's. Now there is no argument about the Sorensen collection being tops in *Haliotis* if not in other groups.

Chester W. Melville, 20 Hammondswood Rd., Chestnut Hill, Mass. " We have just returned from Florida having spent 5 months on the west coast, the Florida Keys, Key West, and returned with many interesting specimens, both land and marine."

Professor T.D.A. Cockerell, 908 10th, Boulder, Colo. They have just returned froman interesting trip to Honduras.

Clyde H. Hebert, 411 West 62nd St.,Jacksonville, Fla. New address- formerly in Louisiana

Jerry Barnard, 400 Wallis, Pasadena 5, Calif. Mr. Barnard plans to spend the summer studying at Hopkins Marine Sta., Pacific Grove

Mr. W. Thurgood, 16, Moss Gardens,Alwoodley Park, Leeds, England. We have the syllabus for 1947 of the Yorkshire Conchological Society with both their very interesting program and the list of members. One project that should be of interest is a trip planned in July on which they hope to confirm an old record from the River Nidd of Margaritifera margaritifera L.

Rev. Wm. Henry Fluck,80 Oak Grove Ave.,Brattleboro, Vermont. " ... You may be interested to hear that I have the Admiral Theodore Phinney Greene, U.S.N. collection of shells.... a neice of mine bought it and presented it to me."

P. Susai Nathan, Kurumbagaram, P.O. Via Karikal, Tanjore District, South India. Mr. Nathan seems to be our only correspondent in South India and while his specialty is insects he also collects shells both land and marine.

Dr. H. Srinivasa Rao, Chief Research Officer, Central Research Laboratories, Madras, India.

Dr. A. Rahman Ranjha, Assistant Suprintendent, Zoological Survey of India, Benares Cantt, India.

Mr. H.C. Ray, Zoological Survey of India, Benares Cantt, India.

The above are but a few of many reporting after the last directory was mimeographed. It looks as if the next edition is going to be about twice the size of the 1947 list.

Dr. Hans Friedrich, Munchen 8, Schneckenburgerstr 15/1, Germany. " The scientific collection of mollusks is till now very difficult in Germany. The houses of Staatsbibliothek and Staatssammlung are destroyed. The books so far as they could be saved cannot be lent. A good many are burned. Also the connections with the private collectors are interrupted. It is doubtful how many collectors are still living."

* Note* A surprising host of collectors have reported for the directory since it was published. They cannot be listed here but will appear in the next issue.

Mildred Cannon, Rt. 1,Box 99, Fort Pierce, Florida. " ... During the past few months we have had several delightful friends who stopped by to see our collections. We particularly enjoyed the sunday afternoon Dr. and Mrs. Clinton Hubbard of Huntington Park spent with us. More recently other shell collectors were here. To mention some- Miss Stella Copper of West Palm Beach, Fla., Miss Esther Bates and Mr. E.R. Kent of Daytona Beach, Fla. and Mr. and Mrs. Harley Freeman of Ohio. Miss Bates particularly loves field work and is most tireless pursuing the elusive mollusk. We did take time to go with her to the sand flats off Sewall's Point. A very interesting and fruitful time."

Edwin W. Carls, Star Route 53, Wrightwood, Calif. Mr. Carl's new establishment bears the name " Nature's Treasure Chest" and from the descriptions it should be a place not to be overlooked when in his vicinity.

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The Long Beach Shell Club

There seems little doubt that the Long Beach group may claim to be one of the most enthusiastic and active organizations in the United States or anywhere else. They meet at 2:30 P.M. in the Long Beach Public Library on the second Sunday afternoon of every month. All interested persons are welcome and visiting collectors whould try to arrange their programs to be able to attend.

Meeting of April 13,1947- The club is carrying on a very fine work in getting together a collection to be sent to the Bureau of Science, Manila, Philippines. The Japanese destroyed the museum's fine collection over there

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as well as their extensive library. Other organizations should follow suit and do all possible to assist in replacing as far as possible this fine scientific institution.

Miss Edith Rex was the speaker of the day and contributed some very interesting notes from her years of collecting on Catalina Island while she was stationed in Avalon as a teacher. Among other things of interest was the observation of living Argonauta at the Isthmus, some carrying their shells beneath them while others had them on their backs. Another item of real interest was the collection of about 5 quarts of Janthina at Avalon. They came up on the beach after a storm and there was a quantity of red algae washed in at the same time, which seemed to just come in on that one tide. * Note*. This species was classified by Miss Rex as J. exigua. However, there are several species of Janthina in collections from this coast, and the more common species we have been labelling Janthina bifida Nuttall whether in error or not, but a comparison of our species with typical J. exigua shows some decided differences. And it might be mentioned that there are also a few in some collections without names and apparently new species and undescribed. The exact dates of the appearance of this genus is of some interest. In May 1939, a large number of Janthina were thrown up on the beach at Hermosa Beach, Calif. during a storm with several other interesting things including a piece of brush to which were attached specimens of the Catalina Island small land shell, Micrarionta gabbi Newcomb. The specimens were dead upon arrival but it might be worth mentioning to those interested in studying the methods of distribution of species. These were obviously blown entirely across the channel.

Mr. and Mrs. Ralph Bormann had collected four specimens of Janthina at Mission Beach as well as specimens of Epitonium tinctum bormanni, and also a surprising report of Terebratulina unguicula from the algae blown ashore there. This Brachiopod is usually taken in rather deep water.

Meeting of May 11,1947.

Mr. H. Arden Edwards of the Southwest Museum was the speaker of the day. He demonstrated the cleaning and mounting of shells. The club was shown how he mounted his papers and leaflets in book form. How to waterproof them with one fifth white shellac and four fifths denatured alcohol. A demonstration of cleaning lime off a shell was given. He first submerged the shell in a 75% solution of hydroclorie acid, then submerging it in a solution of baking soda and water to neutralize the acid and finally washing the shells in water. Members interested in purchasing Ambroid Cement can obtain it from Ambroid Co., Inc., Boston, Mass. For a thinner use Pyroxoline. Those interested in purchasing Gelvacan get it from Shawinigan Chemical Co., Shawinigan Falls, Toronto, Canada. For a thinner use Acetone.

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Minutes of the Conchological Club of Southern California- May, 1947

The Conchological Club of Southern California met at the usual time and place May 6, 1947. The meeting was called to order by the president Dr. W.O. Gregg. There were twenty members present and one visitor, Herbert Schlanger, 3107 Vineyard Ave., L.A. who expressed a desire for membership. There were no reports from standing committees. New publications will be listed elsewhere in the minutes. The secretary, due to immenent change of address to Yuba City, announced the necessity of resignation. It was moved and seconded that this be accepted with regret. Dr. Gregg appointed as nominating committee, John Burch, Mrs. Chace, and Morris Caruthers to report later in the evening which they did presenting as their choice the name of Mrs. Harriette Gillis, who was unanimously elected the Secretary-Treasurer of the club. It is with deepest regret that the now past Sec.-Tres. comes to the end of a ten years happy association in this work and she thanks the members for the honor paid her in choosing her for this work.

The subject for the evening was given. " Notes on Some Western Ocenebras" by Mrs. Mary Bormann. This paper will be published later in the minutes. Her specimens for illustration were artistically prepared and beautiful while the photographs she had had made to show specific and varietal differences were large and showed clearly the details necessary to determine these characteristics. Altogether it made a very interesting paper indeed, and some discussions were carried on after adjournment till closing time was at hand.

Effie M. Clark, Sec. Treas.

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Robert J. Drake, Dept. of Anthropology, Univ. of New Mexico, Albuquerque, N. M. " The middle of June I will go to Chaco Canyon for the University anthropological field session. From the middle of next week until going to Chaco, I have plans for a collecting trip to California and to Pyramid Lake, Nevada. My interests in the nonmarine shells are probably stronger than in the marines as I have been inland for a time..."

Jack H. McClellan and Kathleen McClellan, 1126 Autrey St., Houston 6, Texas. This is a new address.

Fred C. Hadden, Paho-Pago, Tutuila, American Samoa. Attention is called to the fact that the editor misspelled Tutuila " While I am too busy now to do much collecting and no trading, I expect to be able to do so sometime in the future." " ... today we are getting rain, the first in 8 days, which was a long dry spell for Samoa (200 inches per year ! The coolest it has been was 77 F. It is usually around 88 F at 1 to 3 P.M. The less clothes one wears the better, for it is so humid that you sweat all day long until 8 or 9 at night when the temperature drops below 82 F."

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ANOTHER COLLECTINE TRIP IN SOUTHERN CALIFORNIA

By Wendell O. Gregg

April 11 was the date set for this venture and at 6 A.M. Mr. M.L. Walton and I were leaving Glendale with the car packed for a three day trip. We travelled east, first by Foothill Blvd. and then by Highway "70", By the time we reached Indio the weather was getting warmer, much warmer. As we travelled over the Indio-to-Blythe Highway, the engine started heatingand the radiator water boiled away by the gallon. On the desert, that is bad. On this road service stations were few and far between and most of them had signs reading " Water for customers only". We stopped for repairs at Cactus City and at Desert Center and after a three and a half hour delay, continued again on our journey. This time we turned north on the Desert Center - to- Rice road. To the west were the Coxcomb Mts. and to the east, the Palen Mts., which continue northward to the Granite Mts. This road continues past the north end of the Granite range, then turns to the northeast and continues on to Rice. When we reached the northwest end of the Granite range at a point 27.9 miles from Desert Center and 22.2 miles from Rice, we parked the car and prepared to try our luck. This location is where a power-transmission line crosses the highway. A few minutes walk brought us to an outlier of the Granite Mts. About one and three fourths hours were spent turning rocks on the rather steep slopes. We were equipped with prospectors picks and with these we dug about in the soil beneath the rocks which we turned. In all, we collected four good specimens of Micrarionta rowelli granitensis Willett, and a dozen very poor specimens. It was new to my collection.

We continued on thru Rice and at the inspection station west of Parker, we turned south on the road which parallels the Colorado River. At 6.8 miles south of Vidal, the road runs quite near the east slope of the Riverside Mts.

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This is approximately the type locality of Micrarionta immaculata Willett. We parked our car and walked over to the nearest slope, then started digging at the bottom of a rather conspicuous rockslide. The rocks here were of smaller size and easily moved. We dug until it began to get dark, about one and three fourths hours. Luck was with us. We collected about 700 snails, most of them, however, very dead and many of the less ancient specimens were immature. However, we had enough for a nice set of very good specimens for each of us. Only three live snails were found, all immature.

That night we stayed in a cabin at Blythe. The following day we turned back westward on the Indio-to-Blythe road and wasted three or four hours trying to find a pasable road to go to McCoy Spring where we hoped to find Micrarionta rowelli mccoiana Willett. The road has been partially washed out by floods and partially destroyed by the Army's training activities. It was definitely a thing of the past. We then retraced our journey back toward Blythe and where the southern extremity of the McCoy Mts. is nearest the highway we tried for snails. Here the hills were very barren and dry. For over an hour we turned rocks and dug into the hillsides but were repayed with only three very bleached and fragmentary snail shells in an unidentifyable consition. They probably represent subfossil material.

Our next try was for Micrarionta rowelli chuckawallana Willett at Corn Springs. Where the Corn Springs road leaves the highway was a large sign which read " Danger, Sandy Road, procede at your own risk." That didn't stop us. The only living things we saw at Corn Springs were five burros. The type of chuckwallana is about one mile south of Corn Springs. There was no difficulty in finding what appeared to be the locality but we did not find any snails. For over two hours we dug into rock slides. Then exhausted and dripping with perspiration, we decided to concede that this was not our lucky day and leave Corn Springs after our second unsuccessul trip here.

The night of April 12th was spent in Indio. April 13th., the third and last day of our trip found us with very little enthusiasm. The car had been parked in the direct sunlight with doors closed. When we opened the car we saw the thermometer which registered 128 degrees. Leaving Indio by Highway " 111", we turned southwest on the Palms-to-Pines Highway which goes over the Santa Rosa and San Jacinto Mountains to Hemet and the San Jacinto Valley. A short way up the grade we stopped and found a few specimens of Micrarionta indioensis (Yates). Continuing through some very beautiful mountain country we reached the mountain resort, Idyllwild (altitude 5,300). Here we stopped for awhile and ate lunch on the bank of Strawberry Creek. It was in that creek that Mrs. George Kanakoff found fine specimens of Pisidium rowelli Sterki about a year ago. We were unable to find it. Under a rotten log near the stream I found a specimen of the introduced slug, Arion intermedius Normand. This is the most southern record of this slug in southern California. It is common in the San Francisco Bay region but it finds the lower altitudes in southern California too hot and arid.

Continuing down into San Jacinto Valley, we had a surprisingly satisfying meal at a roadside cafe. Then on thru San Jacinto and taking the road past Gillman Hot Springs for a short distance we parked the car near Potrero Creek. Leaving the car we walked for a short distance toward the San Jacinto wash. Soon we were among willows and cottonwoods with quite a few old rotten logs lying here and there. Beneath these logs we found Helminthoglypta tudiculata subdola (Hemphill) and a couple of species of introduced slugs, Limax marginatus Muller and Deroceras agreste (Linn.)

As we neared Glendale, Mr. Walton looked at me and said, " I guess we can regard this tripas a 50% failure, cant we ?". " No" I replied. " I would call it a 50% success." We had travelled about 620 miles.

THOMAS NUTTALL 1786-1859

By Effie M. Clark

Notwithstanding the important contributions he made to science in this country, Thomas Nuttall was born, and died, in England.

In his youth, Thomas Nuttall, like Benjamin Franklin, was a printer. He served his apprenticeship in either his native town, Settle of West Riding, in Yorkshire or else in Liverpool where he had an uncle in the printing business.

One biographer remarks concerning Nuttall, " It often happens that a young man who has begun life as a printer, has afterward attained to distinction in some more intellectual pursuit. So it was with Benjamin Franklin, and so it was with him whose story is now to be told. Whether this is due to the information which the young printer obtains from the matter that is constantly passing through his hands, or whether it is because the most intellectual of the young men who learn a mechanical trade take to printing, it would be difficult to say. The fact only need be noted here.

After working as a journeyman for several years, Nuttall had a disagreement with his uncle and went to London where it would appear he did not fare so very well, for he told, in reporting his experiences there, that he often went to bed at night without knowing where he would locate the next morning's breakfast.

At the age of 22 he came to America, paralelling Franklin, landing in Philadelphia, and like Franklin, starting something the very next day; but it was not a romance in Nuttall's case, for he was shy of people generally, and of women in particular, and remained a bachelor to the end of his days.

The 22 years he spent in England before leaving must have been largely spent in study, for he is described at this time as being quite well versed in the history of his country, knowing Latin and Greek, as well as considerableabout some branches of natural history.

The story is told of him that, on the morning after his arrival here, he took a walk of exploration on the outskirts of the cityand, as he walked, saw a beautiful shiny, green vine that he told himself must be a passion vine. To make sure of this, he picked some of the branches to take home with him. How he succeeded in doing so without disasterous results to clothing and fingers, I cannot immagine, for I, too, have coveted that same green vine for decorative purposes at home, only to later change my mind, after an attempt to posses it. I probably give up too easily- he was not that kind of person. When he reached home with his treasure, his fellow boarders could neither confirm or deny his conclusion, but they could tell him of one who was able to do so. Professor Benjamin Butler was a well-known botanist who lived nearby and to him they directed the inquiring stranger. He went forthwith with his prize and his query. Perhaps because of his earnestness about it or of his persistence in securing a specimen of it, Nuttall was furnished much other information than the name he sought. He found that the vine was not a *Passiflora* but a *Smilax*, and the differences in the two genera were pointed out to him; he also learned that his particular *Smilax* was *Smilax rotundifolia*, the common Greenbrier that many of us have cause to remember, if we have ever tried to pick its shiny green leaves or to clamber through woods where it has established itself as guardian of secret places. Quite a lengthy visit followed, and thenand there an earnest botanist was born, and a life-long friendship begun between two nature lovers. A friendship that did much for the future of Nuttall, though he no doubt would have found his way among the paths of nature, for he had that type of mind that knows no rest but in the finding of answers to the questions that were constantly besetting him. With his new friend he took many walks of exploration which they gradually extended, till the two, or Nuttall alone, covered most of the coast well down into South Carolina, and had gone well inland into Virginia.

When in pursuit of plants, no hardship deterred Nuttall. He had a rather sensitive skin which mosquitoes delighted to feast upon. On one occasion, when he was exploring the swamps of what was thena frontier, he was denied admission to a house where he had applied for refreshment because they believed he had a very bad case of small pox, and it took considerable eloquence on his part before they could be persuaded to the contrary.

On one of his trips to the south he made a new acquaintance, John Bradley, a Scotch naturalist, who had come to America to collect objects of natural history in the interior of the then unexplored country. Though he knew well how many difficulties and dangers would beset them, Nuttall was eager to go along and it was arranged that he should go..

The two set out together from St. Louis in 1809 and, in part, followed the route taken five years before by Lewis and Clark. They extended their journey still farther up the Missouri, but only at the cost of incredible hardship and danger. At one time on their trip Bradley was only saved from the Indians by taking his watch to pieces and literally"giving the Indians the works". On another occasion, Nuttall was so overcome by weariness and hunger that he laid himself down to die, and the career of a promising young naturalist would have ended there, had not a friendly Indian found him and carried him down the Missouri to a white settlement. In spite of all the obstacles they had to encounter, Nuttall came back in two years with a fine supply of seeds, plants, minerals, and many other things of interest he had picked up on his long journey.

He spent eight years in Philadelphia studying his collections and making others in the south and southeast.

He was a quiet, shy man, his only acquaintances being his fellow workmen and their families. It was in the home of one of these, Col. Collins that he had a room that they had reserved expressly for him. Because he was so shy and did not like to meet people he did not know, he once arranged a ladder--like stairway so he could go and come without meeting anyone, unless he chose to do so. As a mark of this friendship, he named a family of very dainty little plants Collinsia.

His first book, Genera of North American Plants, was published in 1818, and of this book, Prof. Torrey, in the preface to a book of his own, says of Nuttall's work that it had " contributed more than any other work to the advance of the accurate knowledge of the plants of this country."

Since Nuttall was a printer, he set type for the greater part of the book himself. It is worthy of note that, notwithstanding the importance of the book, he was then but 32 years old.

In the preceeding year, 1817, he had been made a Fellow of the Linnaean Society of London, and later in that same year was also elected a Member of the American Philosophical Society. He was next made a Corresponding Member of Natural Sciences of Philadelphia, and began writing for the Journal of the Academy.

In 1818, he made another excursion to the Southwest where he came near losing his life from illness and exposure, yet, in spite of that setback, completed a journey of over 5,000 miles,through territory which, to that time, had been unexplored, and that was Indian territory as well.

In 1820 he published his account of this expedition, and during the next two years, published several other articles, one of them on minerology. During this time, he also lectured to classes of young men on various botanical subjects.

In 1822, he was made curator of the Botanic Garden at Cambridge and given some teaching to do. His salary was a modest one, but his wants were few and his position gave him an opportunity to have what he wanted most, time for study.

Minerals and ornithology were by this time taking up considerable of his attention.

During his residence at Cambridge, he seems to have had but one intimate friend, Mr. James Brown, and it was at the suggestion of this friend that he produced in 1832 his Manual of Ornithology of the United States and Canada. Of course, the writing of this book was not done on the spur of the moment. He had always been interested in birds and observant of their habits, and his various expeditions had given him unusual advantages for further study.

Though it has since been revised and illustrations added, his manual at the time it first appeared, was comprehensive and quite fully illustrated. It is still in use among bird lovers, and I remember well how my own small boy used to lug it to bed with him every night to have a final good night visit with his favorites, the Bittern being held in highest esteem.

In 1833 while working at Philadelphia on a collection made by Uaptain Weith, Nuttall's wandering foot again asserted itself and he could think of nothing so desirable as to accompany " the Captain" on another trip he was planning. He received permission to go, and, since his leave of absence from Cambridge was too short to permit it, resigned and spent the time till they were ready to go working on foreign collections at Philadelphia.

On this trip he was joined by John K. Townsend and they started out together from Indianapolis in 1834. They crossed the Rocky Mountains,- no s small feat in those days- and reached and descended the Columbia to Ft. Vancouver, where they spent the autumn collecting. Then, to avoid spending a winter where collecting would be hampered, they took ship for the Sandwich Islands, where they landed Jan. 5, 1835.

Collecting in a tropival climate was perhaps the most pleasant experience Nuttall ever had, and he spent two happy months at it, getting mostly plants and sea shells. He then returned to California where he spent the spring and summer, returning once more to the Sandwich Islands, and then went back to Boston by way of Cape Horn, it chanced by the very ship where Dana was serving his " Two Years Before the Mast".

Dana tells how Nuttall, catching sight of the coast, as they were passing in the foggy, dangerous coast of the Horn region, begged the caotain, though in vain, to let him go ashore to study the vegetation. He did this, notwithstanding the fact that there was a severe gale blowing and icebergs all about them,and, he was deeply affronted at what he regarded a deplorable lack of enthusiasm where science was concerned, on the part of the captain. He could not understand how anyone could be that way.

It was October before he reached Philadelphia, and he immediately went to work on his collections, becoming now greatly interested in Conchology- so much so that he often forgot to go to his meals. His fellow workers, when they returned from their noon recess, would often find him bent over the same trays of shells he had been working on, when they went out to dine. Nuttall was an odd looking man with a very large, bald head, an expansive forehead and small features, with gray eyes and fleshy eyebrows. He was of fair complexion and, because he studied hard and often took little exercise was often pale and looked ill. He was large and stout and stooped and walked with a mincing step.

At times he was absent minded, and once on an expedition got lost from his party who sent out some friendly Indians to look for him. They thought he was a great medicine man and were afraid to come too near him and he, remembering the dangers he had encountered in the past,thought they were enemies seeking to do him harm. They carried on this wild goose chace for three days before he found his party.

At another time when there were some really hostile Indians to be faced, it was found he had used his gun to dig plants till, had he tried to use it, he and not his Indian enemies would have been blown to pieces. On another trip he found so little to eat his friends did not recognize him when he returned.

In 1841 an uncle in England died bequeathing him quite a property in Nutgrove near Liverpool, but with the condition that he should live there at least 9 months every year for the rest of his life. This Nuttall did not wish to do, for he had become used to American ways and liked his work, so he hesitated for some time about accepting the legacy with the conditions it imposed, but he had sisters and they had families, and so to favor their interests, he decided to assume the duties of a landed proprietor.

Taxes and incumbrances made such inroads on his inheritance that he felt it necessary to live on the land and work with his laborers as they did. He, however, managed to find time to cultivate rare plants which a nephew collected for him, and he wrote descriptions of them for the British journals.

He returned to America but once in the 17 years he lived after he went to England, and that time he stayed 6 months, 3 in 1847 and 3 in 1848 and spent most of that time in Philadelphia, preparing a report of a Rocky Mountain collection and of California plants collected by Wm. Gamble.

His death, 11 years later, was caused by his eagerness to open a case of rare plants and in doing so he strained himself by lifting too great a weight. His injury was so serious that his death some time later was the direct result.

So ended the life of a great and self-made man-- a great botanist, and an enthusiastic collector of minerals, a leader among ornithologists, and a very earnest student of conchology.

While Nuttall left no lineal descendents, his name lives in the literature of, not one, but at least three branches of science.

In the reading of his life I became curious to see how many times his name had been given to different plants or animals in my own small collection of books and this is what I found.

In ornithology I found one genus of flycatchers, Nuttallornus had been dedicated to him and five species, a woodpecker, Dryobates , often seen in our California foothills, a magpie, Pica nuttalli, common on our coast, a whip-poor-will, Phalaeontophtus nuttalli californicus, and a very near relative of a lighter color, nuttalli nuttalli, both by no means rare in the West, and a sparrow common about San Diego, Leucophrys nuttalli.

Since, with one exception, my bird books all lean to the popular side and are written for the study of western birds there are probably more than as many more that bear his name. In the exception, Nuttall's own book, I found his name not at all.

Searching my botanical possessions, which is a far from complete collection even for an amateur botanist, I found much more.

A genus of hollyhocks, Nuttallia, was dedicated to him by Barton in 1822, but had to give way to Callirrhoe because Nuttall had given it that name in 1821.

Searching for specific names, I found an evening primrose, which was later changed, an onion of the westand middle west which seems destined to remain as is, Allium nuttalli, and another of the lily family with what seems to be a permanent name, Zygadanus nuttallii, though it has been placed in two different genera, one by Gray in 1873 and another by Watson in 1879. A pondweed, common in the east, bears the name Potomogeton nuttallii, and a beautiful anemone, which has been juggled around quite a bit. It once bore the name *Anemone nuttallii,* was made into a variety of another species by Gray, called several other names by others, and perhaps now has settled down as *Pulsatella hirsutissima,* because of a priority of names dating back to 1814. This charming flower still adorns northern praries, delighting the hearts of flower lovers in the spring and quite generally known as Nuttall's Pasque Flower.

There is a rag weed that thanks to Dr. Green, sheds its pollen to the western breezes and causes hay-feverites to sneeze to Nuttall's memory.
A grass that still bears the common name of Nuttall's Reed Grass was once given his name but has been changed by the priority rule.
A mint that was named for Nuttall by Gray in 1856 had to be replaced by the name Nuttall himself gave it in 1817, and presumably still smells like mint all the way from New York to Texas.

We have but to go to our nearby mountain parks to find Nuttall's Mariposa lily being gathered by the armfuls by children small and tall, and which will probably result in its ultimate extermination.

Nuttall's Golden Aster may be found from Kansas to Louisiana, and a sedge found in the marshes from Maine to Mississippi/

An umbillifer, a figwort, a goosefoot, a milkweed, and a carrotall honor him in the west and middle west.

A beautiful Euphorbia that delighted my childhood and a sunflower dedicated to him by Torrey and Gray is common in much of the Rocky Mountain region.

A bush clover was dedicated to him by Darley. A pretty little lobelia, named *Lobelia gracilis,* and fittingly too, in 1818 by Nuttall and was changed to *L. nuttallii* in 1919, but I could not find out why.

The list is farther swelled by a cactus, another umbillifer, a beautiful western buttercup, another sunflower, and a hedge nettle all strive to do him honor. Last, I came upon *Viola nuttallii,* named for him in 1814 that was one of the delights of my early botanical forays, a dainty little plant that children all the way from Canada to Arizona may find in the spring, if they but seek out this shy little flower.

These are all flowering plants, but I think I dimly remember his name among the mosses, mushrooms and lichens whose names are fading from my memory.

Turning to conchology, I found descriptions by Nuttall in my small collection of books, He was well remembered by his friends and I have no doubt that my list is far from complete.

A genus of chitons was named in his honor, *Nuttalina,* by Carpenter in 1873. A crab, *Epialtus nuttalli,* was named for him by Randall in 1873. In the year 1873, his friend, Timothy A. Conrad, named six shells in his honor. They were, *Purpura nuttalli, Mytilimeria nuttalli, Phacoides nuttalli, Saxidomus nuttalli, Sanguinolentia nuttalli,* and *Schizothaerus nuttalli.* If that was not sufficient proof of friendly adoration, such proof would be hard to furnish. In the language of today it could be trully said that Timothy A. Conrad had a severe crush on Thomas Nuttall. So, although Thomas Nuttall was excessively shy and remained a bachelor to the end of his days, his long busy life had its touch of romance after all.

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The following paper is a continuation of the work on The Fresh Water Mollusca of California by Wendell O. Gregg, M.D.

Pisidium occidentale Newcomb, 1863. Proc. Calif. Acad. Sci. II, 1863, p.94

" P. testa P. variabilis (Prime) affinis; rotundato-ovata, obliqua, inequilatera, hyalina vel fusco-cornea; notibus approximatis vix prominentibus; striae minutissimae. Long. 4 mill. Alt. 3 3/4 ,ill.

" Hab. 'Ocean House', San Francisco

"Shell near P. variabilis (Prime) roundly ovate, oblique, inequilateral, transparent or brown horn color; umbones approximate but slightly prominent; striae extremely minute.

" We are indebted for the discovery of this, and many other species , to the researches of the Rev. Mr. Rowell, of San Francisco.

" This is the first species of the genus Pisidium found in our country west of the Rocky Mountains." (Newcomb, 1863, p. 94).

Type Locality : " Ocean House", San Francisco. " Dr. Hanna says 'Ocean House' was located close to Lake Merced, on or very close to the present location of Fleishhacker Pool. The type locality of P. occidentale is therefore very probably in Lake Merced." (A.G. Smith, in litt.)

Distribution: Generally distributed all over California and south in Lower California, Mexico, to latitude 23 deg. 30 min. (Baily, 1935, 77; Orcutt, 1915, 77; Sterki, 1916, 467). Also reported from Spokane Falls, Wash. (Roper, 1896, 99); and from Wa;ker Canyon, Nevada (E.P. Chace, Sterki's identification). Colorado, " somewhat scarce and apparently not characteristic (Sterki, 1923, 21).

Dr. Sterki has identified specimens for us from Meadow, Tioga Road and Happy Isles, Yosemite Valley, Mariposa Co. (Chace); and Cuyamaca Lake, San Diego Co. In the S.S. Berry collection there are specimens from the following localities, all identified by Dr. Sterki: Pacific Grove, Monterey Co.; Dry Lake (alt. 9,050 ft.); swamp at Bluff Lake (alt. 7,550 ft.); Bluff Lake Creek, Dollar Lake (alt. 9,250 ft.); marsh at Knight's Ranch and Kid Creek, all in the San Bernardino Mts., San Bernardino Co.; North Park, Cuyamaca Mts., and creek back of Warner's Springs (alt. 3,200), San Diego Co. " It is found in a little brook running out of Mountain Lake, near San Francisco." (Keep, 1904, 64).

This situation is rather confused since all specimens I have seen which Dr. Sterki identified as P. occidentale were definitely a form of P. abditum and in no way suggested P. variabilis Prime as noted in the original description. Rev. Herrington stated that this form should probably be considered as only a subspecies of P. abditum. Herrington had seen specimens of the form commonly identified by Dr. Sterki as P. occidentale but at the same time he made the statement he was unfamiliar with Newcomb's description. It would appear that our above distributional data is worthless being based largely on incorrect identifications. The genus being difficult to work with, scarcely anyone except Dr. Sterki attempted to identify themand no one ever thought of questioning his identifications.

Pisidium insigne Gabb, 1868. Amer. Jour. Conchology. IV, 1868, p. 69, pl. II fig. 2.

" Shell minute, transverse, oval, subquadrate, very inequilateral, compressed, anterior side produced, obliquely truncated above; posterior side regularly rounded; beaks very small, hardly projecting beyond the outline of the shell; hinge delicate, the lateral teeth long and slender; surface ornamented by a few minute striae; color light yellowish-brown.

Dimensions: Long. 09 in., lat. .07 in.

" Habitat: From spring at FFt. Tejon; collected by Dr. Geo. H. Horn. Cabinet of the Philadelphia Academy.

" Remarks: This species is more nearly allied to *P. ultramontanum* Prime than any other American Pisidium. It is, however, not *half the size* and differs markedly in *outline*." (Gabb,1868, p.69)

Type Locality: Spring at Fort Tejon, Kern Co., Calif.

Distribution: In addition to the type locality, Ferris (1917, p.34) reported *P. insigne* from First Kern Butte, which I believe to be in Tulare County, *Calif.* We are unable to find any other record of its occurance.

Pisidium ashmuni Sterki,1903. Nautilus, XVII, p 42.

" Mussel somewhat elongated, moderately inequipartite, scarcely oblique, moderately inflated; superior and inferior margins moderately curves,supero anterior slope curved down to the rounded anterior end situated well below the median line; posterior and subtruncate, with more or less of an angle at the scutum; beaks somewhat posterior, rather broad, rounded,moderately elevated over the hinge margin; surface shining, with microscopic, shallow, rather regular, crowded striae,and one or a few impressed lines of growth; color pale horn, shell translucent, thin; hinge slight, plate narrow; cardinal teeth rather long, fine, lamellar, the right curved with its anterior end much shorter and situated much higher up on the plate than the posterior which is somewhat thickened; left anterior of the same shape as the right, rather hook-like at the anterior end, the posterior oblique, slightly curved and passing over about two-thirds pf the anterior; lateral teeth rather long, produced far beyond the pointed cusps; outer laterals of the right valve slight but distinct; ligament rather slight. Size: Long. 2.8, alt. 2.3, diam. 1.6 mill. Long. 2.3, alt. 1.9, diam. 1.4 mill. Most specimens are intermediate.

" *Pis. ashmuni* ranges under the *abditum* group. It is easily recognized being of *about the same size with Pis. splendidulum* St. It is more elongate and its beaks are broader." (Sterki, *1903, p. 42).*

Type Locality: San Rafaels, New Mexico (Rev. E.H. Ashmun).

Distribution: " New Mexico, southern California." (Sterki 1916, p.467)

Distribution in California: Dr. Berry reports *P. ashmuni* from Swamp at Bluff Lake, San Bernardino Co., specimens *identified by Dr.* Sterki.(Berry 1909, p. 79).

Pisidium nevadense Sterki,1913. Nautilus, XXVI, p. 137.

" Mussel inequipartite,oblique, higher in front of the beaks than behind, medium inflated ; superior and posterior margins little curved with a rounded somewhat over the right- angle between them,inferior rather long,somowhat descending toward the rounded anterior end, supero-anterior slope somewhat curved; beaks nearer the posterior end, medium large, rounded, slightly prominent over the hinge margin; scutum and scutellum barely marked; surface somewhat shining, with slightirregular striae and a few slight, impressed lines of growth; color: straw, shell subtranslucent, rather strong; hinge curved, medium stout, plate rather broad; cardinal teeth rather large, the right with the anterior part somewhht thickened, the posterior much thicker, with a deep groove, nearly bifid, left anterior long, angular curved, posterior long curved, oblique, extending forward well beyond the apex of the anterior; laminae little projecting inward, cusps short, pointed, especially those of the left valve; ligament and resilium rather long, moderately strong. Long. 6, alt. 4.8, diam. 3.3 mm(100:80:55)." " This *Pisidium* has the best formed cardinal teeth of any seen." (Sterki, 1913, p. 137).

Type Locality: Nevada County, Calif.

Distribution: Known only from the type locality.

Pisidium ultramontanum Prime,1865. Mon. Corb. 1865, p. 75

" Testa ovato suborbiculari, subinequilaterale, compressa,solidiuscula; umbonibus parvis, subdepressis, parum prominulis.

" Shell comparatively solid, oval-suborbicular,subinequilateral,compressed; anterior side much produced between the extremity of the lateral tooth and the junction with the basal margin; posterior margin rounded; beaks small, not full, not much raised above the outline of the shell; valves shallow in the cavity; hinge strong; striae delicate; epidermis light brownish horn color. Long .20; Lat. .16 in. Long 5,: Lat. 4 mill." (Prime, 1865, 75)

Type Locality: Canoe Creek in California.

Distribution: " British Columbia to California" (Sterki,1916,467) " Vancouver Island to Mono Co., Calif. (Orcutt, 1915, p. 77).

Distribution in California: As above noted it ranges in California as far south as Mono County. " Duck Lake, Lassen County and in Feather River, Plumas Co. " (Baily, 1935, 77).

Pisidium randolphi Roper,1896. Nautilus, IX, 1896, p. 99

" Shell rounded oval, moderately inflated; anterior end elongated and perfectly rounded, no angle indicating the junction of the anterior and basal margins; posterior margin sloping abruptly from the very short hinge margin; beaks decidedly posterior, fairly prominent; surface very finely and evenly striated, polished, of a most peculiar greenish-yellow color, different from other Pisidia, but much like some Corbiculas. This of itself makes it easy to separate from P. abditum and P. variable, associated species. Long. o.18 inch; lat. 0.14 in.; diam. 0.10 in. Found at Seattle. Dr. E.G. Cooper says the shell most nearly resembling this is P. harfordianum Pr. , a species practically unknown to collectors,and of which he has only a young specimen." (Roper, 1896, p. 99).

Type Locality: Seattle, Washington

Distribution: Washington; one locality in northern California has been brought to our attention.

Distribution in California: Camp Rodgers, 50 miles up Feather River Canyon from Oroville, Plumas Co., (E.P. Chace).

" The external appearance is somewhat like P. variabile Prime, but the hinge is different." (Herrington, in litt.)

Pisidium angelicum Rowell,1867. Proc. Calif. Acad. Sci. Ser. 1, vol.3,1867, p. 353.

" Shell rounded oval, nearly equilateral, very convex; margin well rounded; beaks very slightly raised and very approximate; surface subgranulate, marked with from one to six very decided striae or lines of growth; teeth too minute for observation.

" Long (of largest) 2 mill, Lat. 1.5 mill., Diam. 1 mill

Habitat: Angel Island

" Of California species, it is most like P. abditum, but differs in its sculpture, its less prominent beaks and its more globular and equilateral form. Most specimens are covered by an exceedingly persistent coat of jet black mud, making examination of them very difficult; but some are perfectly clean." (Rowell, 1867, p. 353).

Type Locality: Anegl Island, near San Francisco, Calif.

Distribution: Known only from the type locality.

Pisidium fabale Sterki,1916. Annals of the Carnegie Museum, X, Nos. 3 & 4, Art. XVI, pp. 429-474.

"Mussel rather large, subequipartite, barely oblique, moderately inflated, outlines oval to almost elliptical, or posteriorly subtruncate obliquely outward and the supero-anterior slope very slightly marked; in young and adolescent specimens these features are more marked, and there is a distinct angle at the junction of the superior and posterior margins; beaks a l slightly behind the middle, moderately large, rounded, slightly elevated and a little projecting over the hinge margin; scutum slightly or barely marked, narrow, scutellum not noticeable; surface somewhat shining, with fine, somewhat shapp,crowded, irregular to subregular concentric striae and a few slightly marked lines of growth; color pale corneous to straw or light yellowish, generally with narrow, irregular, alternating zones of these shades; shell thin, fragile, somewhat translucent; inner surface microscopically wavy rugose, muscle insertions and pallial line distinct; hinge slight, rather short; cardinal teeth: the right curved, thin, its posterior end more or less bifid, left: anteriorshort, thin, strongly curved, posterior short, oblique slightly curved to nearly straight, its anterior end extending to barely above the middle of the anterior; laminae rather short, slight, little projecting inward; of the right valve; the anterior inner with its cusp near the middle, little elevated and barely pointed, the outer small and barely one fourth the length of the inner, posterior similar; left both short with cusps distal,pointed, somewhat abrupt; ligament rather long, resilium not thickstrongly folded, with the insertions extending rather far downward on the hinge plates. Long. 8, alt. 6.2, diam. 4.2 mm (100:81:52)."

" P. fabale appears not to be closely related to any of the other N. Am. species, so faras I know. It is of about the same size as P. rowelli (Western) and alleni (northeastern) , but differs from both in shape and appearance, and the formation of the hinge. It is less inflated, less inequipartite, the beaks being less posterior, and less elevated."(Sterki, 1916, p. 468)

In the above description, taken verbatim from the original, there are so obvious erros of punctuation.

Type Locality:Lost Horse Creek near Carlos, Bitter Root Mts,Montana

Distribution: Bitter Root Mts., Montana at " various places. Meade and Clark Counties, Kansas (Leonard, 1943, p. 234). One locality has been reported from California.

Distribution in California: Meadow, Tioga Road, Yosemite National Park. Specimens collected by E.P. Chace were identified by Dr. Sterki.

Pisidium abortivum Sterki, 1916. Ann. Car. Mus. Vol. X, p. 469.

" Mussel small, subequipartite, slightly oblique, subquadrangular, moderately inflated; superior and inferior margins little curved,posterior subtruncate to rounded, supero-anterior slope well marked, slightly curved, anterior end rounded angular, situated well below the longitudinal median line, beaks barely posterior, little elevated, somewhat flattened on top; surface somewhat glossy, with very fine, slight,crowded concentric striae and generally a few slightly marked lines of growth; radial lines, very fine, crowded, irregularly broken,are over the beaks and extending over about the central one third of the valves, gradually evanescent; color pale corheous to whitish or straw, shell thin,translucent to opaque; hinge short, slight, plate narrow; cardinal teeth small and slight, the right somewhat curved, its posterior end not or slightly thicker, both in the left valve short, nearly straight, the anterior close to the edge of the plate; laminae: the right anterior, inner witha cusp not abrupt, in about its middle, the posterior quite small with a slightly marked cusp ;outer ones both small, about half as long as the inner; left: both small, short, with cusps somewhat distal, rather abrupt, obtusely pointed; ligament and resilium short and slight.

" Long. 2.4, alt. 1.8, diam. 1.2 mm. (100:75:50)

" This *Pisidium* is rather inconspicuous and has hardly any striking features. The mussel appears to be the young of some other species, but hundreds of specimens from nepionic to manifestly adult prove its being distinct. It shows little variation, except in the form noted below. In size and shape it is somewhat like a form of *splendidulum,* but in other respects is markedly different; in color and appearance it somewhat resembles *imbecille* but the latter is somewhat more elongate and more inflated, the superior margin is more curved, the beaks are narrower and more prominent."(Sterki, 1916, p. 469).

Type Locality: Lost Horse Creek, near Charlos, Bitter Root Mountains, Montana.

Distribution: Bitter Root Mts., Montana at various places. Boulder Co. Colo.. " Appears to be widely distributed in the west." (Sterki,1923,p.22) Four California records have been brought to our attention. " Many lots of these from northern Alberta and the North West Territories as far as Great Bear Lake in the Arctic." (Herrington in litt.)

Distribution in California: Sunrise Trail to Merced Lake (Berry) and Happy Isles (Chace), both in Yosemite Valley, Mariposa Co.; Panorama Camp, Greenhorn Mts., Kern Co. (Walton and Gregg); Mill Creek, Forest Home, San Bernardino Mts., San Bernardino Co. (Berry).

Pisidium tremperi (Hannibal), 1912. Proc. Mal. Soc. Xm p. 137, pl.VII,f.22

" Shell minute, globular trigonal, beaks anterior, broad, and somewhat elevated, hinge much reduced; habitat marshy lakes. Length 1.4, alt. 1.3 mm; depth of valves 1 mm." (Hannibal, 1912,p. 137).

Type Locality: Bluff Lake Cienaga, San Bernardino Mts., Calif.

Distribution: Known only from the type locality.

Described as *Corneocyclas tremperi* Hannibal.

" Apparently near *P. ashmuni.*" (Sterki,1916, p. 471). This is probably the young of what Dr. Sterki identified for Dr. Berry as *P. ashmuni* which was from the same locality. (Berry, 1909, p. 79)

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SOME FRESH WATER SNAILS TGAT ARE DISEASE CARRIERS

By Effie M. Clark

My subject, as it is assigned in the program, is far too broad in one way, and too narrow in another, so I limit the diseases considerably and widen the geography a little, since there is pretty good evidence that these unwitting, if not unwilling, go-between mollusks do not know of, or give heed to, state lines when they select, if they do select, their place of residence, so I must broaden my geography to take in, with the west flowing head-waters of Oregon streams, some of the more northern California ones as well.

Since the dawn of civilization, goats, sheep, and dogs have been of value, interest, and often of affection to a large portion of mankind, so anything that vitally affects their welfare can hardly be a matter of complete indifference to any of us. This is my excuse, if any is needed, for the selection of such a topic.

I have always deeply, and it may be sometimes, foolishly, loved dogs. I have been duly respectful of the sheep, his wool, and his mutton. When I came to know them, I grew trully fond of goats. I had thought I knew considerable about their life history, but I had not dreamed, till last summer, that the well being of all of them was intimately tied up with some of our conchological units.

Some years ago, due to a turn of the " Wheel of Life", goats capered on to my horizon, bringing delight in their antics and joy in their capriciously expressed love.

Be as comtemptious as you will of my choice in " objects of affection", you will hardly be able to laugh off the significance of the fact that, during the three and a half years of the existence of the " Iris Goatery", nine lives, balanced on the brink of disaster, were towed, by the goats and I, to the safer side of healthy living. (con.0

I know I seem to wander a bit from conchology, but bear with me a bit while I try to show you why the things I found out in Oregon last summer interested me so deeply.

Goat-raising, for me, did not prove to be all fun and milk production. Hard times fell upon us, and painful and mysterious death came to many of my affectionate little friends. Their pitiful, child-like cries for help I could not give them goaded me on to exploring what must have been more than a mile of the little victims intestines before the cause was found and a merciful cure could be effected. Down that long and dismal journey, I found fiends aplenty but never a sign of a Liver Fluke, though I had heard of them and was on the lookout for signs of their deadly work. Now I know the reason; my acreage in the middle west was a dry one, and had no fresh water population, though other fiends had flourished there as I came to know so very well.

During a vacation in Oregon last summer I met Dr. Jas. H. Shaw of the Oregon Agricultural College who has pioneered in the investigation of this subject, and you may well immagine the interest what he had to say about this work had for me. I am deeply grateful to him for the time he spent in telling me of it, as well as for his later help in supplying me with literature and material that so clearly and convincingly illustrates the subject.

This brings me to the life history of one of the arch-fiends that work such dire destruction to sheepand goats, the Liver Fluke. Though these poor quadrupeds are the worst sufferers from its ravages, they are no no means the only ones, for cattle, deer, hogs are in a lesser degree their victims.

From a paper prepared in a zoology course at U.S.C. by a friend, Miss Jessie Hutchinson, I quote this very concise history of the Liver Fluke:
" The Liver Fluke will serve as an example of internal parasite- as all of them undergo a series of like changes from egg to adult. This flat-worm lives normally, in the adult stage, in the bile passages of sheep,goats and other ruminants, pigs, and occasionally man." (I was unable to verify the finding of the human host and Dr. Shaw does not mention it, though he did successfully inoculate guinea pigs in his experimentation). To return to the paper -." Soon after reaching their destination, reproduction commences. Eggs pass out through the uterus of the fluke, and are carried by the bile to the intestines of the host, then out of the body with the faeces. One fluke may produce as many as 50,000 eggs but few of the embryos are likely to survive. These eggs, if they chance to encounter water of a moderate temperature, hatch out as ciliated larvae, or microcidia. The larvae swim about until they encounter certain fresh water snails, then force their way into the soft parts of their host's bodies. If no snails are found within 8 hours, the larvae die.

Within the tissue of the snail, the embryo changes into a sac-like sporocyst. Each germ cell within this sac develops into a second kind of larva, or redia, which soon breaks through the wall of the sporocysts and migrates into the tissue of the snail. These rediaea, in turn, give rise to a second generation of rediaea, and then to a third kind of larva, or cercaria.

These cercariae force their way out of the body of the snail, swim about in the water for awhile, and then excyst on a leaf or blade of grass. If the cecariae are eaten by a sheep, they escape from their cyst-wall and make their way into the sheep's bile-duct where they develop into mature flukes in about six weeks.

The great number of eggs produced by the mature fluke is necessary,

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because the majority of the larvae do not find the particular kind of snail susceptible as a host, and the cecariae stand little chance of being devoured by a sheep. However, the generations within the snail increase the number of larvae which may develop from a single egg."

This ends the quotation from my friend's paper. The Latin name of the villain which she so well describes, is Fasciolaria hepatica, and in the title of a German book I saw it followed by the familiar L. though I did not find it elsewhere. That is dating back quite a number of years, as indeed, it has been known and dreaded, for a long time, but it was not until 1928 that the host for our American form was identified.

The first suspected European host was Lymnaea trunculata Muller . It was found and described as a host, in North Wales by Wright W. Rees, in 1917.

On this side of the Atlantic, Galba bulimoides Lea is the host these predatory animals seem to have chosen, almost or quite unanimously. Though Physa tritica Lea, Galba bulimoides techella Haldiman, Galba ferruginea Hald., Lymnaea trunculata Draper, L. parva Lea, L. palustris michiganensis Walker, Galba decidiosa Say, G. obrussa Say, and G. humilis have all been found in infected pastures, only twice have any others been found parasitized; these were Galba ferruginea Haldiman. Five different snails from as many pastures known to be infected, were found to be infected, and were identified as Galba bulimoides Lea.

Since a half grown snail van be parasitized, and can also deposit ova, not once, but several imes a year, with from 7 to 70 ova in each mass, in a water space no larger than a wagon-wheel rut or a sheep track, and since snails are able to dry up for six months or more without harm, it would seem that there are plenty of hotel space or rest home facilities provided to carry on the Liver Fluke race.

Fortunately, a preventative has been found, as well as a partial cure for the poor animals that have not been too thoroughly riddled in their vital organs by the ruthless invaders. Work is also being done to try to secure immunization, which, if successful, will allow the snails to go on with their life-work if clearing water of what, to us looks like impurities, but to them is food. It is to be hopes this will be done, for clearing mountain pastures of snails would seem to be a hopeless, as well as expensive task, though that is one of the ways people are now working to control the disease.

Let us now take a look at one of Fido's many troubles:- The one I refer to is known as " Salmon Poisoning of Dogs", though dogs are by no means the only animals that suffer from this very fatal disease, since all the dog family are susceptible to it. The villain in this case was once thought to be much lower in the zoological scale, in fact, at the very bottom of the ladder- an amoeba.

In 1926 and 1927, independent observers decided that they were also flat worms or flukes, and bestowed upon them different names, the one that seems to be now accepted being Trogolotrema salminicola Chapin. Like the Liver Flukes they lead a double life- what is worse, a triple one, for a snail, a fish, and then a dog, is the diabolical course they seem to have mapped out for themselves. Though their name salminicola indicates that salmon is probably "preferred", they are not very exclusive in the matter of taking up a residence, and almost any fish, with the same habits and habitat will suit them very well, thank you. Doubtless the poor fish is not overly anxious (if he ever gets anxious about anything) to entertain these non-paying guests, who often move in on him in numbers something like 10,000 and upwards- 186 having been found in the muscles of one eyeball of one 4 inch trout. Strangely enough, these invasions do not seem to be fatal to fish that

(con.)

pass the infant stage, for a small trout was caught near Corvallis, and when his guests were counted, they numbered 14,062, and he was by no means a dead fish when captured. It would have been a very different story had it been a misguided dog that thought to make a meal of the little fishe's over-populated carcass.

On his way to torture poor Fido , this travelling Fluke detours a bit spending a little time in the nice sofy body of a fresh water snail. It is not just any snail for him. Though young and small, this traveller is quite " choicy" about where he puts up on his journey, for out of twenty snails studied in infested areas, only one, Goniobasis plicifera silicula (Gould) was found to contain the parasite. In these, the invaders were found in great numbers, probably causing some inconvenience, but no evidence of other harm was present.

The range of this snail is supposed to be the western water shed of West Oregon, and the Cascades, the northern limit being Olympia, Wash., though Dall reported it from British Columbia. Two other species, acutifilosa Stearns, from Eagle Lake, California, and G. nigrina Lea from the upper reaches of the Sacramento, are listed in Keep. Whether these are ever parasitized or not I do not know, though I do know that our beloved setter, Micky, got out in apparent good health for a swim in Bear Creek, and we found him dead on its bank. Bear Creek runs down the mountains from near Yosemite, and teems with other fresh water mollusks, as wellas fish, so we have wondered, if fish are ever parasitized by the " dog poisoning fluke" in regions that far to the south.

The poor canine victims of this fluke suffer terribly, and the poisoning is usually fatal. If the dog is fortunate enough to recover from the infestation, the indications seem to be that he is thereafter immune, so studies are being made in the hope of finding a serum to immunize dogs, as well as foxes , which are fed largely on fish, and which are becoming increasingly valuable as fur-bearers.

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The registration follows:

Arthur Haas, 3511 2nd Ave., S., St. Petersburg, Fla.
Edna Haas, " "
Eugene H. Schmeck, 8711 Buffalo Ave., Niagra Falls, N.Y.
Phil Spicer, Rt. 2, Box 237, Centralia, Washington
Mrs. Agnes Spicer, " "
F.R. Aldrich, Aldrich Museum, Balboa, Calif.
S.L. Kimball, Weaverville, Calif.
Glenn W. Webb, Ohio, Illinois.
E.P. Chace, 24205 Eshelman Ave., Lomita, Calif.
Mrs. Elsie M. Chace, " "
Dwight W. Taylor, 1955 Mendocino Lane, Altadena, Calif.
D. Dwight Taylor, " "
Clarice Feldonridge, 2419 F. St., Omaha, Nebraska
Nellie C. Williams, 4216 Meredith Ave., Omaha, Nebraska
Ralph Bormann, 4331 Vermont St., Long Beach, Calif.
Mrs. Mary Bormann, " "
Richard W. Foster, Mus. Comp. Zool., Cambridge, Mass.
Dan L. Emery, 121 24th Ave., S., St. Petersburg, Fla.
William J. Bower, 340 3rd St., S., St. Petersburg, Fla.
Effie M. Clark, 4206 Halldale Ave., Los Angeles 37, Calif.
Ernest N. Wilcox, 1738 Johnson Ave., San Luis Obispo, Calif.

(con.)

Allyn G. Smith, 722 Santa Barbara Road, Berkeley, Calif.
John Q. Burch, 4206 Halldale Ave., Los Angeles 37, Calif.
Mrs. John Q. Burch, " "
Ralph O. Fox, 1048 Monterey Ave., Berkeley 7, Calif.
Leo G. Hertlein, Calif. Acad. of Sci., San Francisco, Calif.
Andrew Sorensen, 247 Granite St., Pacific Grove, Calif.
Mrs. A.T. Whelchel, " "
John Strohbeen, 315 King St., Santa Cruz, Calif.
Mrs. J.P. Strohbeen, " "
H. Arden Edwards, 217 S. 2nd Ave., Alhambra, Calif.
Mrs. H. Arden Edwards, " "
Myrle A. Sprague, Pacific Grove, Calif.
George L. Harrington, 556 Washington Ave., Palo Alto, Calif.
Carl Hegner, 1904 Holden St., Los Angeles 41, Calif.
Mrs. Carl Hegner, " "
Joyann Paul, 252 Spruce Ave., Pacific Grove, Calif.
Aurile LaRocque, Univ. of Mich., Ann Arbor, Mich.
Mrs. Aurile LaRocque, " "
Harold W. Harry, Rt. 2, Bx. 222, Shreveport, La.
Dr. A. Myra Keen, Stanford University, Calif.
Mrs. E.B. Keen, " "
Wendell O. Gregg, M.D., 2200 S. Harvard Blvd.,Los Angeles 7, Calif.
Dr. Howard R. Hill, Los Angeles Museum, Los Angeles 7, Calif.
Mrs. Howard R. Hill, "
Viola S. Bristol, 1253 12th Ave., San Diego 2, Calif.
Mrs. Theano W. Case, 2442 2nd Ave., San Diego, Calif.
Mrs. Margaret Teskey, 144 Harlem Ave., Buffalo 10, N.Y.
Ted Dranga, 4451 S.W. 14th St., Miami 34, Fla.
Agnes J. Shumate, 1433 6th St., Santa Monica, Calif.
Dr. Henry van der Schalie, Univ. of Mich., Ann Arbor, Mich.
Mrs. Henry van der Schalie, " "
Arnold van der Schalie, " "
H.R. Turver, 8640 Evergreen Dr., Southgate, Calif.
Mrs. H.R. Turver, " "
Ruth Hacking, 904 Pellon Ave., Santa Cruz, Calif.
Alice R. Everett, R.D. 4, Bx. 204, Santa Cruz, Calif.
Dr. Earl H. Myers, 173 Upper Lighthouse, Pacific Grove, Calif.
Ethel M. Myers, " "
Miriam Shepard, Box 164, Rt. 2, Portland 10, Oregon
Ruth E. Coats,702 E. 1st St.,,Tillamook, Oregon.
Lucia Wiley,Portland Art Museum,Portland 1, Oregon
Lotus Simon,Portland,Oregon
David Nicol,Stanford University, Calif.
Kay Lawler, Box 2367, Carmel, Calif.
Mrs. M.L. Russell "
Miss M.R. Glen,3430 Oceanview Ave.,Pacific Grove, Calif.
M.L. Walton, 1108 N. Central Ave.,Glendale, Calif.
Mrs. M.L. Walton " "
H.E. Westcott, Guam M.I.
Mrs. Lynn W. Conlan, Carmel Valley, Calif.
M.H. Knoules, 231 Central Ave., Pacific Grove, Calif.
Mrs. Olive W. Knoules, " "
Roberta Sylvester, 232 Chestnut, Pacific Grove, Calif.
Paul Chenoweth, 2090 Beach St., San Francisco 23, Calif.
Maxine W. Chenoweth (Mrs.) "

Charles R. Wright, 1502 Sixth St.,Sanger, Calif.
Mrs. Charles R. Wright, " "
Dr. Frank MacFarland, 775 Santa Ynez, Stanford University, Calif.
Mrs. F. MacFarland " "
Herb Schlanger, 3107 Vineyard Ave., Los Angeles 16, Calif.
Bruce Parker, 2123 N. Gower St., Hollywood 28, Calif.
Dr. L.R. Blinks, Hopkins Marine Station, Pacific Grove, Calif.
Dr. Rolph Bolin, " "
Ferdinand Ruth, Monterey Junior College, Monterey, Calif.
Dr. Elmer Berry, U.S. Public Health Service, Bethesda, Maryland

It is hardly fitting for the hosts to state that the meeting was a great success. That should be left to the visitors. However, we certainly enjoyed our guests from the north, eastand south and think that all attending had a good time. A few notes on the meeting follow.

Mr. A. Sorensen and daughter, Mrs. A.T. Whelchel, host and hostess, and John Strohbeen, presented each member who registered at the Asilomar Hotel witha gift box of scientifically labelled shells from Guaymas, Sonora,Mexico.

At the annual banquet Mr. Sorensen served shrimp cocktails from Guaymas and crab salad and abalone steaks from Monterey Bay. At each plate were souvenirs of two fine shells, Phyllonotus nigritus and bicolor from Mexico as well as corsages made by Mrs. John Q. Burch and Mrs. A.T. Whelchel from fushias grown in the gardens of the host and hostess and of the Hodges Fushia garden.

Mr. A.J. Bower and Dan Emery brought shells from Florida as gifts to the members in attendance. These were greatly appreciated and they were both given special boxes of California shells to take back to Florida.

A cake honoring our oldest member, Mrs. Theano Case who is 93 years old (more active than many of the younger collectors), and John Q. Burch's 53rd birthday which fell on June 20th, was presented at dinner time with full ceremony including song and greetings. An Indian in regalia presented Mr. Burch with an axe to cut the cake. Much credit should be given to Chef Padola for his thoughtful attention throughout the meeting. He is now converted to our hobby and is starting his collection. The head table was decorated with dahlias from Mr. Sorensen's garden.

At this dinner the dredgers presented the guests with live specimens of Calliostoma annulatum Humph. and Calliostoma dolarius Holten. The dredgers were John Q. Burch, Allyn Smith, Dick Foster, Ted Dranga and Pete Riser. This expedition was through the courtesy of the Hopkins Marine Station who supplied the boat and the invaluable assistance of Pete Riser, a candidate for his doctors degree at Hopkins.

The program of the meeting is briefly outlined below.

Wednesday, June 18,1947

10 A.M.- 12 Noon: Registration
2 P.M. : Address of welcome by Dr. L.R. Blinks, Director of the Hopkins Marine Station.
Response- Dr. Henry van der Schalie
Papers-
1. " The Fauna of Monterey Bay" by Allyn G. Smith
2. " Land Snails of the California Deserts" by Dr. W.O. Gregg
3. " Collecting in Ecuador" by Jay Marks
4. " Notes on the Mating of Some Zonitoides (Ventridens)" by Glenn R. Webb
6:30 P.M. : Annual Dinner
followed by Business Session

(con.)

Thursday, June 19,

10 A.M.: Papers
1. " California Land Snails and How Some of them Live" by E.P. Chace
2. " Michigan Pearl Button Industry" by Dr. Henry van der Schalie

Noon Hour

2 P.M. : Papers
1. " A Brief Review of Tropical West American Bivalves" by Dr. L.G. Hertlein
2. " West American Turridae" by A.M. Strong (unfortunately unable to attend)
3. " Some Abnormal Shells of Pacific Marine Mollusks" by Dr. H.R. Hill
4. " The Preparation of a Bibliography of the Literature on Mollusk Biology" by Richard W. Foster
5. " Dredging on the Mendocino County Coast" by Dr. G. Dallas Hanna read by Allyn G. Smith

8 P.M. : Illustrated Address by Dr. Rolph Bolin, Assistant Director of the Hopkins Marine Station

Friday, June 20

5 A.M. : Shore Collecting- Led by Ferdinand Ruth, Science Instructor of Monterey Junior College

10 A.M. : Papers-
1. " Protozoans and Foraminifera" by Dr. Earl H. Myers
2. " Mollusks introduced into the Pacific Coast through the importation of seed oysters from Japan" by Professor Trevor Kincaid, read by John Q. Burch.
3. " Remarks on Checklists" by Dr. L.G. Hertlein
4. " A Comparative study between members of the genera Pomatiopsis and Oncomelania " by Dr. E.G. Berry, U.S. Public Health Service

2 P.M. :
1. Exhibit of rare shells received at Stanford University during the war. by Dr. A. Myra Keen
2. Exhibit of world Haliotis- by A. Sorensen
3. Exhibit of dredgings from Monterey Bay- by John Strohbeen

8 P.M.: Address- " The Land and Fresh-water Mollusks of Puerto Rico" by Dr. Henry van der Schalie.

Saturday, June 21

5:30 A.M.: Shore Collecting led by Ferdinand Ruth
10 A.M. : Visit to the Hopkins Marine Station
Visit to the Pacific Grove Museum
Trip around the 17 mile drive and Carmel.

It will be unfortunate if the interesting papers read as well as some of the discission following them is not published.

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New Publications Received

Nautilus Vol.60, No. 4 April,1947. This issue is devoted to a verywelcome index of New Families,Genera,Species etc. in Volumes 35 to 59.

Dr. H. Burrington Baker has contributed in this index something that we will appreciate and use. Of course, it is not a complete index to the Nautilus vols. 35 to 59, and a complete index is badly needed. No doubt most students have done as I have done and made their own index, but mine is very naturally confined to the papers referring to the fauna of this coast in some way. In order to locate anything else considerable reading and searching is required.

Bulletin of the Southern California Academy of Sciences- Vol. XLVI, Pt. 1 Jan.-April,1947. There is one paper in this issue dealing with mollusks " Egg Laying of the European Brown Snail in Terraria" by William Marcus Ingram.

" Recent Studies of Sediments in the Java Sea and Their Significance in Relation to Stratigraphic and Petroleum Geology" by Earl H. Myers " Science and Scientists in the Netherlands Indies" 1945

" Rate at Which Foraminifera are Contributed to Marine Sediments" by Earl H. Myers , Journal of Sedimentary Petrology, vol. 12, Aug. 1942

" The Mating-Anatomy Technique As Applied to Polygyrid Landsnails" by Glenn R. Webb, The American Naturalist, vol. 81, pp 134-147, March-April, 1947.

" Shell Notes" Vol. 1, No. 20 by Frank Lyman. One of the great mysteries to me is how Frank can turn out such a fine little booklet and give it away. It is far better than most of them for which we have to pay a substantial sum. This issue contains many interesting items- one excellent paper by Laura G. Snyder of Wichita, Kansas.

And I always seem to learn something surprising myself. For example Frank puts in capital letters in his brief on cleaning shells DO NOT USE SOAP. Now that is a sort of a challenge to me because one of the first things I do when I bring in a batch of the big heavy shells such as our Haliotis is to put them in a tub full of nice warm suds and scrub them with a laundry brush. To tell the truth that is about all the beautifying they ever do get at my hands, but my experience has been that soap helps no end in getting the scum and dirt off of them and I have never noticed any bad effects. Perhaps Frank will give me more information on the error of my ways in this regard. Of course, I wouldn't wash a Cypraea or any such a thing in soap or anything else other than clear water. And as most of my correspondents know they usually are lucky to get mine with the mud washed off of them. I have often seen my own shells after they were fixed up and failed to recognize them.

Frank wrote me on June 25 about one of his current deep sea dredging trips modestly suggesting that he did not know how much of a success the trip was and then mentioning several species such as Scaphella florida and dubia that I would have to get out the books to get any idea of what he had, never having either seen nor heard of them.

If you are not on Frank's list you are missing something. Write him at Lantana, Florida.

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News from and About Collectors

Dr. G. Dallas Hanna of the California Academy of Sciences is spending the summer making a scientific reconnaissance of Dall Island, Southeastern Alaska.

Dr. Sol I. Light, Professor of Zoology at the University of California, Berkeley was drowned in a tragic accident in Clear Lake in June. His death is a great loss.

G. Mandahl-Barth, Danmarks Akvarium, Charlottenlund, Denmark. Wishes a few specimens of Amonitella, Polygyroidea and Glyptostoma. The editor sent him a small set of Glyptostoma newberryanum and also of gabrielense. Mr. Mandahl-Barth has Scandanavian material for exchange. Perhaps other members may have duplicate specimens of the other genera or species desired.

J.R. le B. Tomlin, 23 Boscobel Rd., St. Leonards-on-Sea, England. " ... I have again entered the service of the British Museum (Natural History) and go up to help them in the mollusk department 2 or 3 times a week. That uses up a good deal of time, as it is a railway journey of some 1 3/4 hours each way. I am very anxious to obtain for my collection any species of marine shells that I don't already possess. This, of course, mostly means the deep water species. .." Mr. Tomlin has fine material in exchange for other fine material.

George Bryant, Route 1, Alton Sta., Kentucky. Mr. Bryant is editor and publisher of " The Wildcrafters World" which he has just sold to Laurence Barcus, Terre Haute. It is a popular small magazine devoted largely to hunting and fishing but occasionally contains a paper of considerable interest to us. The June 1947 issue contains a paper by Bill Nelson " The River Man's Game". Mr. Nelson is a collector of river mussels and his paper is really very much worth reading. He not only knows his shells but gives you the point of view of the commercial collector.

Walter J. Eyerdam, Seattle, Wash. Is off to Alaska again. Letter dated June 8th " About the end of this week I shall be off to Alaska again... I expect to find more time this summer to do some more dredging.." Mr. Eyerdam has been doing some exchanging on a large scale. His reports of exchanging hundreds of species indicates the fine stock of duplicates he has to offer.

F.M. Bayer, Assistant Curator, Division of Marine Invertebrates, U.S. National Museum. We heard of Ted's present work but seem to have retained his former Florida address. Ted has proved himself to be an excellent and careful conchol--ogist and we are happy to learn of his present work.

Fred Tobleman, 13½ Brenner St., Newark, N.J. We are happy to hear that Mr. Tobleman is again active and recovering from the long illness he has suffered. " I hope to get in the work again as soonas I can get around without crutches. I was operated on for an osteo condition of the left knee which has left me with a stiff leg that is a bit shorter than the right."

C.A.W. Jeekel, Zoologisch Museum, Afd. Entomologie, Zeeburgerdijk 21, Amster--dam- O, Holland. This is so far from our line of interests that it is very doubtful if this notice will do him any good but " ... I am specializing on Myriopoda (Centipeds and Millipeds) and I should like it very much if you could find someone who would send me such material. ". In short he wishes to exchange centipedes.

Mrs. Nelson R. Perry, P.O. Box 827, Asheville, N.C. " A few days ago I received your memo of shells. It is fine and inspiring and makes me quite homesick for times past. Circumstances of life changed so much for me from those old days that I hardly know any of my old salt water habits as belonging to myself. For several years I have been conducting an eye clinic here in western Carolina which is a far cry from the old avocation....."

J.L. Staid, 123 Rue Clovis, Rhiems,Marne,France. Mr. Staid is again actively exchanging and has world wide duplicates.

Mrs. Margaret Teskey, 144 Harlem Ave., Buffalo 10, N.Y. We are pleased to welcome Mrs. Teskey to our circle.

George F. Reynolds, 1723 Park Ave., Richmond 20, Va. Mr. Reynolds is interested in exchanging world wide marine and fresh water shells.

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Minutes of the Conchological Club of Southern California- June meeting

The Conchological Club of Southern California met June 3rd with 21 members present and 2 guests. The meeting was called to order by the president Dr. Gregg. The reading of the minutes was omitted. The balance in the treasury is $5.80. Mrs. J.Q. Burch on behalf of the club presented our out-going Secretary and Treasurer, Mrs. Effie M. Clark with an over night case in appreciation of her more than 14 years of faithful and efficient service. We were reminded that since the founding of the club in 1902 there had been only four secretaries Miss Lilian Zech, Mrs. E.P. Chace, Miss Gay and Mrs. Clark. It was called to our attention that Dr. Strong is still in Balboa. There being no business the meeting was turned over to the speaker of the evening, Mr. E.P. Chace. His subject was Pectinidae, illustrated with chart and specimens.

Hariette Gillis- Secretary.

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SOME WEST AMERICAN OCENEBRAS

By Mary Bormann

Notes on the article appearing in the October issue of the Nautilus, 1946

There has been considerable difference of opinion among west coast conchologists as to the validity of certain species and subspecies of the Ocenebras. In the past this has been because of inadequate original descriptions, lack of material for comparisons and variations within the species from place to place along the coast; new names given to shells and never published and in one case the shell was named and published twice, both times as a new subspecies but using the same name.

The present study is an attempt to clear up some of the problems relating to several forms that have been associated with the common and variable West American species, Ocenebra interfossa Carpenter.

Reasons for the use of the name Ocenebra instead of Tritonalia have already been given by Winckworth and others and summarized in the Minutes of the Conchological Club of Southern California: no. 51, p. 44 for August, 1945 (John Q. Burch, Editor) and need not be repeated here.

I became interested in this group when we tried to classify some seemingly rare specimens in our collection and took exception to the above mentioned Minutes when it was proposed to lump these varieties, with the exception of beta, under interfossa s.s. and doubt was cast on the validity of O. interfossa clathrata , O. interfossa minor, and O. interfossa atropurpurea. I am not going into a detailed description of these shells as I believe that was taken care of in the Nautilus, October, 1946. I am just going to give a few of the details, with the idea in mind that this article might make students including myself just a little more careful with their work.

Ocenebra interfossa interfossa (Carpenter).

The type of this shell was figured and appears both in Bulletin 112 and Mrs. Oldroyd's set of books, Marine Shells of the West Coast of North America. In the original description it states, " the lattice of revolving lirae"-- no mention is made of " reticulate sculpture" that was noted in the Minutes of the Conchological Club of S.C. " This is a common form with the lattice-like reticulate sculpture." (No. 51, p. 48).

But in typical interfossa, the spiral sculpture is more pronounced than the axial, giving the shell a corded appearance instead of the deep pits. The shoulders of the whorls seem more rounded in this subspecies than in any of the other varieties of O. interfossa. My shells were checked at the U.S. Nat. Mus. with the type specimen and in checking over a large group of specimens from our collection and the collection of John Q. Burch, O. interfossa seems to run fairly close to type. Range of shells in our collection; Piedras Blancas (Bormann) Crecent City (Chace) Russian Gulch(Smith). Type Loc. Monterey Bay.

Ocenebra interfossa atropurpurea (Carpenter), 1865. This shell was never figured and to make it more interesting it was described and the name published twice. Ocenebra interfossa atropurpurea Carpenter- Proc. Phila. Acad. Sci. 1865, p. 64, Aug. 1865. Tritonalia interfossa atropurpurea Dall (new subsp.) Proc. U.S. Nat. Mus., vol. 56, p. 334, 1919. Dr. Carpenter gets the credit for naming this shell as his paper was published in 1865.

The name atropurpurea is misleading as it means a dark purplish color. The real difference between typical interfossa and this subspecies is the sculpture, rather than the color, and also in outline, the shoulders of the whorls being more tabulate. O. i. atropurea Carpenter has the large pits mentioned in a free translation of the original description. The ones used in my paper were found at White's Point, California. I also examined specimens

(con.)

from Monterey in the Burch collection and from San Pedro collected by the late Dr. Tremper. Specimens were checked with the type in the U.S. Nat. Mus. by Dr. Harald Rehder.

Ocenebra interfossa clathrata (Dall),1919. The type was never figured but I think lack of recognition of the subspecies was due to scarcity of material and an inadequate description. O. i. clathrata differs from O. interfossa s.s. in the shape of the spire, in the shorter, broader body whorl, and in the proportionately longer canal. The distinguishing features of the shell seem to be the tabulate whorls with extremely clathrate sculpture showing squarish pits prominently on the shoulder and on the spire. The original description states " this is a short stout form with very prominent rectangular clathration and flatly turreted spire."

Ocenebra beta Dall. This form has not hitherto been figured. As O. beta seems to be closer to O. barbarensis Gabb and O. squamulifera Carp. than to O. interfossa s.s. It seems best here to consider it a distinct species. Specimens hitherto identified as O. beta by Southern California collectors represents a different species, the Ocenebra keenae of this paper. The true identification was made when the shells were checked with the type photograph (appearing in the Nautilus) and confirmed by Dr. Rehder when specimens of O. beta were sent to the U.S. Nat. Mus. for checking. There has been quite a bit of discussion as to how closely O. beta and the shells we are calling O. squamulifera are related, and as to whether O. squamulifera is represented in the Recent living fauna. I do not have the material for the necessary surveyat this time.

Ocenebra keenae Bormann,1946. (New Species). Nautilus, October,1946, vol.60 p.2, figs. 17-18. " Shell brown, often banded with white or buff, of medium size, somewhat turreted, whorls 5; sculpture of 6 to 8 axial ribs crossed on the last whorl by numerous spiral cords, one strong cord at the shoulder, about 7 weaker ones above, about 10 major and 7 minor cords below; whorls tabulate, intersection of axial and spiral sculpture forming blunt spines; area above shoulder with imbricate sculpture on the last two whorls; spire with two principal and one to two intercalary cords; aperture white, ovate; outer lip flaring, thick, with 5 to 7 denticles within; apertural varix frilled; canal moderately long, straight closed.

Holotype: Stanford Univ. Paleo. Type Coll. no. 7915; paratype no. 7916. Additional paratypes to be deposited in the United States National Museum; Academy of Natural Sciences of Philadelphia; California Academy of Sciences; San Diego Museum of Natural History; Los Angeles Museum; and in the private collections of Allyn G. Smith, Emery and Elsie Chace, A.M. Strong, John Q. and Tom Burch, Ralph and Mary Bormann.

Type locality: White's Point, Los Angeles County, Calif.

Dimemsions: height, 19 mm, diameter , 10.5 mm, height of body whorl, 12 mm

Range: White's Point (Bormann) to Imperial Beach (Burch).

(I haven't verified the record from Imperial Beach, but a specimen of O. keenae was collected by Mr. Burch at Portuguese Bend.)

This shell has been incorrectly identified as O. interfossa beta by Southern California collectors, but there are consistent differences in proportion and sculpture, O. keenae having a shorter spire, a large aperture, and more strongly imbricate sculpture on the tabulate part of the last whorls and the much smaller size separate it from that form.

I take pleasure in dedicating this species to Dr. Myra Keen of Stanford University, who has done so much to further the study of conchology and has been of great help in interesting others to carry on the work."

Ocenebra minor (Dall),1919. This shell like some of the others was never figured and the description is poor. Original description: " This is a pale,

(con.)

dwarf, slender form, also from Catalina Island which seems nevertheless to have reached maturity. It is strongly clathrate and measures in height. 7, and in diameter, 3.5 mm." The description does fit the shell but I would like to add, ' shell creamy white with brown bands on most specimens; whorls usually 5 in addition to the nucleus; a distinct constriction separating the body whorl from the canal; lip a little thickened internally, with no denticulations, but with slight grooves corresponding to the revolving lirae outside.

Upon the aavise of Mr. Allyn Smith I have ranked O. minor as a distinct species. He says (letter dated Jan. 2,1946);" The shape of the shell, configuration of the body whorl, and the general lack of the squamose sculpture that is typical of interfossa would seem to be enough to set minor off as being different, and I would be inclined to take it out of interfossa."

Dr. Keen writes (letter dates Sept. 27,1945) that specimens of O. minor in the Stanford Collection, from San Diego, were identified by Dr. Philipp Carpenter for the collector, Henry Hemphill, as a new variety of interfossa However, Carpenter did not publish the name he applied, and later it was used by Dr. Dall for another variant."

Lack of recognition seems due to scarcity of material, and the mixup of names mentioned above caused confusion when a check was made of the group in the Stanford Collection.

Color varieties- I do not consider color enough to warrant a new variety, but I do think that sometimes the shellsare worthy of mention. While Mr. Bormann and I were collecting at Piedras Blancas, California we found specimens of O. circumtexta that were deep purple, almost black. But as the specimens agreed in every other way with typical circumtexta we decided it was just an unusual color form/

Credit was given for the splendid help received, in the nautilus and I will have a few reprints for anyone who is interested in them.

The correspondence with reference to the above paper is on file and anyone doing more work with this group may refer to it.

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Additions to the Discussions of Corbicula and Musculium

Dr. Hans Schlesch, Pernillevej 23, Bispebjerg, Kobenhavn NV, Denmark.

" ... for Minutes for May. Page 3 Corbicula is also given Recent from southeastern Europe-- it does not at present live in Europe, but appears (C. fluminalis) in Syria, Palestine, Armenia, Georgia, Mingrelia, Mesopotamia, Persia, Transcaucasia, Turkestan, Afghanistan, etc. In Diluvial time C. fluminalis had a wide distribution in Europe. Also on Page 10, Musculium is given as a separate genus of Sphaeriidae, but forms, however, only a subgenus of Sphaerium. ..."

Dr. W.O. Gregg comments as follows on the above:

" We are glad to have the correction on the distribution of Corbicula . As noted, this is a quotation from the publication by Pilsbry and Bequaert (1927:338). Publications referred to in our compilation on the Cyrenidae and Sphaeriidae are listed in the Bibliography, Minutes, 70:19.

It seems to be a matter of opinion as to whether certain subgenera should be raised to generic rank. The present tendency is to raise many subgenera to generic standing. There is said to be no anatomical distinction between Musculium and Sphaerium though typically the shells are quite distinct. Temple Prime treated them as all of a single genus, Sphaerium. In the use of Musculium as a distinct genus, I merely followed such American authors as Frank Collins Baker, Junius Henderson, Victor Sterki, Bryant Walker, and others. Rev. Herrington believes Musculium not worthy of full generic rank."

TYRIAN DYES AND THEIR SHELL-FISH ORIGIN

By Effie M. Clark

Closely associated in the minds of most people with Tyrian Dyes is the phrase " Tyre and Sidon and the cities of Phoenicia", yet Tyrian Dyes long before they became Tyrian, go much farther back in time, and had a greater significance in the lives of their users, than the important place they held in the minds and fortunes of those " maritime peddlers " of that far-off time.

Associated with " Pearlsand Tritons" and under differing names, they have travelled much farther afield than the hardy Phoenicians ever dreamed of going, or even knew was in existence.

Undoubtedly, or as undoubtedly as anything so far in the past can be, in these days of constant research and new discoveries, the beginning of the use of shell-fish as a dye originated in the island of Crete, which- and quite possibly because of this discovery- was, in turn, fought for by three neighboring city states. There- to this day- great banks of the shells of *Murex trunculus* may be found, and, in them, shards of pottery believed to be pre-Phoenician.

Nearby Cyprus, where the, then, all important copper, was discovered, furnished also the " Chonchs and Perals", which, associated with the dyes, made up a triumvirate of symbols that has been carried by worshippers around the world. The chronicle of this journey, could it be known and written, would form a library unsurpassed in drama and tragedy, with, running through it all, that thread of gold, the search by questing man for God.

What the average person knows about Tyrian dyes might be classed as of historical, rather than theological significance, but deeper study into its origin shows the theological aspect to be of the greater significance.

Among the " best-sellers" in which the subject finds mention, we find the Bible, Talmud, and Aristotle's History of Animals, while articles written by such well known authors as Ezekiel, Samuel bar Judah Philo, Josephus, Aristotle, and Pliny give evidence of its great importance.

More eloquent than the written word, however, are the vast piles of broken and crushed "purple shells" which have been found in so many places. These, togethor with the fragments of broken pottery and the tools they contain, tell of the extent and antiquity of the industry.

Written accounts of the " purples" and their use as dye materials show that the process was well established as far back as 1600 B.C., and that their use was not discontinued till the fall of Constantinople in 1453 A.D., so it flourished for a good 4,000 years or more, which, when one comes to think of it, is an unusually long time for a single color to stay in style.

The " Pearl", representing soul-substance, the " Triton", calling men together for worship and their gods to hear them, and the " Purple", turning men's thoughts to Heaven, have kept ever together intheir amazing journey around the world.

" Beginning- not " at Jerusalem"- though not far from that place- we find their trail across the Iberian Peninsula and into Ireland and South England, all around the Mediterranean and Red Sea, far into Egypt, on the west coast of Africa, and no one knows how far into the continent on the west coast. Around the Black and Caspian seas we trace it, on into India, Korea, and Japan, up the Chinese rivers well into the interior of Asia, so far as we know, and probably because of the Barrier Reef missing Australia, we take up the trail across the Pacific to where we come upon abundant traces of its arrival in Mexico, Central America, Bolivia, Peru, North Chile, and in Brazil. All in all, a rather breath taking trip, when one takes into account the lack of travel facilities under which it was carried on.

As has been said, the earliest use of " purple", as a dye, was part of a religious cult, and, concerning its use, in the early writings of the Old Testament, two shades of the color were recognized under the names " teleket" and " argamen". Teleket was used for the fringes of the Temple and were called " siset". It also appeared in the raiment of the High Priest, and was made use of in the veils of the temple, thirteen of them being placed in the Temple of Solomon.

This color, so like the Mediterranean skies, was undoubtedly selected as a symbol for the turning of men's thoughts to Heaven. " Argamen", the red-purple, no doubt symbolizing life as suggested by blood, was prized, but not held to be sacred. There is a reference to its use in the seat covers of Solomon's palanquin, and another which speaks of virtuous women being fittingly arrayed in " argamen" and sesh".

After the Romans conquered Palestine, and probably much to the horror of the Israelites, purple, for those entitled to wear it, became a very stylish color; but woe betide the upstart below the rank of royalty, who dared to so far presume as to ape his " betters ", for on such the death penalty was prescribed.

It certainly was a most expensive luxury, for during the reign of Augustus, a pound of wool, properly dyed, sold at something like $1600, and weight for weight, was about equal in value to gold. Nor was this great price all profit to the dyers or to the Phoenicians middlemen who collected it, for one of the bestadvertised purples of that day was made by the use of two solutes, one of " purple", and one of Buccinum, which seemed to add brilliance to the color. It has been written that to color 50 pounds of wool, 100 pounds of Purple and 200 pounds of Buccinum were necessary- of the extract mind you. This extract, when obtained from each individual mollusk was measured by drops rather than ounces or its, then, equivalent.

Wool seems to be the material first and most often used. In later days, silk was sometimes so dyed, and on the Western Hemisphere, cotton and agave fiber. In the days of later Roman luxury, it would appear that linen also, was sometimes colored in the same manner.

" Red Sails in the Sunset", though popularized there, did not originate in Hollywood, for in Roman times, the rank of a ship owner was indicated by the width of the purple border he was allowed to put on his sails. A large ship of Ptolemy was described as having " sails of fine linen ornamented with a purple border", while the style leaders, Anthony and Cleopatra, were reported as going into action at Actium " with purple sails"- no less.

The experimenter of today who sets out to do a bit of purple dying must, of course, first " catch his hare", and by that is not meant our common " " Sea Hare ". Having experimented with that colorful animal, I am free to say, had the results of that attempt at decoration been worn on the streets of Rome, it would have caused its wearer, no matter how plebean, no legal embarassment. The purple-dying I refer to is the genuine- you might call it the orthodox method with perfect propriety. The would be dyer to properly prepare for his task, should read the accurate instructions for proceedure given in the Talmud, where this occurs: " What is Hilazon (meaning snail-shell)? Its shape is like unto that of a fish, and its body is like unto the sky, and it only comes up once in 7 years." Further search would yield this information: " Its body (color) is like unto the sea: its shape unto a fish, and it comes up once in 70 years". To our exact Western minds the Oriental discrepancy of 63 years seems quite a gap, and the shape " like unto a fish" is likewise a bit vague, when we recall that in those days a fish, of somewhat variable shape, might take on a vaguer outline by including mollusks and Cephalopods, as well. As our seeker after methods reads on, he finds: " "and with its blood teleket is dyed, and therefore it is very dear". Armed with this exact information, there is nothing left for the dyer to do but find his hilazon.

As to who he or they are, widely different conclusions have been drawn. Rabbi Isaac Hertzogg of Dublin believes the Talmud description identifies the animal as one or more of the species of *Janthina*, either *pallida* Hanley, or *prolongata* Blainville, both of which have an abundance of coloring matter- even to an ounce in a well developed *pallida*; though he admits that they do not " come up regularly".

The consensus of opinion is not with him, however, and does not seem to be borne out by study of the shell-piles. Such study has proven most enlightening, and so, when we find an account of 200 to the square foot of Purple shells, all broken and in a peculiar manner, and when we learn that, except for a few Indian tribes, and it may be by the Chinese, that these are not used for food, it is most natural to believe that a clew of considerable importance has been found.

Quite a majority of those who have had access to these shell piles and who know their shells, believe that for " teleket ", or blue-purple, *Purpura lapillus* and two species of *Murex*, *erinaceus* and *trunculus*, were chiefly used, while for the " argamen", or red purple, *Purpura haemostoma* and *Murex brandaris* were relied upon. That was, of course, after the business got going in a large way, whatever may have, at first, been used. To be sure, if a dyer wished to make purple dye, and the afore mentioned species were not at hand, others could be, and undoubtedly were, sometimes substituted. There is some evidence that the well known *Rapana bezoar* was used for this purpose in Japan, and considerable certainty that, in Central America, *Purpura patula* took the place of its Mediterranean relatives.

When purple dying was at the zenith of its production, both Aristotle and Pliny described the process somewhat as follows: " the liquid which is found in a branching transparent vessel behind the neck of the animal is, when first removed, like thick cream in both color and consistency. It is taken from the larger shells by breaking a hole in the side, while the smaller ones are crushed in a mortar. It appears that the liquid taken from the larger shells had to be carefully handled and quickly removed from the sac which contained it, or the color would rapidly deteriorate.

The fluis thus obtained was mixed with salt, about ohe fourth of a pound of salt to 100 pounds of liquid, and stood in this form for about three days when, with water added in proportions of about 5 parts of water to 8 of the dye, it was put to boil in a vessel of tin or lead. During the boiling, it was frequently skimmed to remove the impurities that arose to the surface- about ten days being required to complete the process of making a finished dye solution. Wool, freed from its natural oils and dirt, was then used as a trial to test its fitness. Concerning this test we read in the Talmud that Abaji said to Rabbi bar Judah, " Now, about this Teleket- how do you dye it ?" and the Rabbi answered, " We take the blood of the hilazon and drugs, put them into a kettle, boil the mixture, and then take out something of the liquid into an egg-shell, and burn that sample of wool."

The dye, so made, was most lasting. Later on, it may have been brightened by putting the wool through a second dye of Buccinum origin, as has been before mentioned.

Curious color changes took place in the liquid which was, at first, color-less, then light yellow, then pale green, then bluish, then purple-red, such changes going on faster or slower, according to the intensity of the sunlight.

A by-product of the coloring process was a very disagreeable odor, resembling garlic. Some of the ultra-fastidious laid in complaints to the, then, Chamber of Commerce, that real estate in the vicinity of the dye works suffered price-deterioration- so beach contamination has not alone been a California problem.

The cloth, thus dyed, while the very acme of style, retained a "scent " not"of roses that clung round it still". This probably explains why all the " first families" and their satellites made such excessive use of such power-ful perfumes in those far-off, colorful times.

We, who hesitate to wear our purple and lavender dresses in the bright sunlight, lest they fade, will be glad to know that no such problem vexed the minds of the wearers of Tyrian Purple, for the color was fadeless, even in that land of almost perpetual sunshine.

History records that when Alexander took possession of Susa, he found, among the looted treasures of Darius, 5000 talents, amounting each, to from 50 to 110 pounds, according to the country which evaluated them of Tyrian purple cloth. Whatever, the evaluation, the value was well up to par, for though the cloth had lain there for 180 years, it yet retained all its freshness and brilliance of color. The odor was not mentioned, nut may have had much to do with the decision of moths not to do any " corrupting," in the vicinity of that treasure house.

History also records that one Servius Tollus, once upon a time, dedicated a statue to Fortune. It was garbed in a purple-bordered praetexta- we now call them tunics- but, whatever name the garment bore, it did not change color in 560 years according to no less an acredited authority than Pliny.

By the time the industry reached our shores, some modifications had taken place in its tecnique. The source of the coloring matter did not change, though the name of the color did, and it now became " Purprea de Pan-ama ", according to d'Augenvillè, who so-called it in 1742. He believed the mollusk used to be, Purpurea persica. However, Bruguiere in 1789 and Lamarck in 1803 pointed out the difference between that species and the one used, which is undoubtedly our Purpura patula.

In 1684, Thomas Gage, an English-American, in his book " Travels by Sea and Land" wrote: " About Chira,Golfo de Salenas and Nicoya there are some farms of Spaniards, few and very small Indian townes, who are like slaves employed by the Alcalde Major, to make him a kind of thread called Peta (agave fibre) which is a very rich comodity in Spain, especially of that colour wherewith it is dyed in these parts of Nicoya, which is a purple colour, for which the Indians here are very much charged to work about the sea shore,and there to finde certain shels, wherewithal to make this purple dye."

Squeir, in 1852, writing of Nicaragua, said : " Some of the cotton fabrics manufactured by the Indians are very durable and woven in tasteful figures of various colors. The color most valued is the Tyrian Purple, obtain-ed from the Murex shell-fish, which is found upon the Pacific coast of Nicaragua. The color is produced of any desirable depth and tone and is permanent- unaffected alike by exposure to the sun and to the action of alkal-ies.

The process of dyeing the thread illustrates the patient assiduity of the Indians. When a sufficient number of shells are collected, which being dried of sea water, the work is commenced. Each shell is taken up singly with a slight pressure upon its mouth (operculum), which forces out a few drops of the coloring fluid leaving the animal almost destitute of color. In this each thread is dipped singly, and after absorbing enough of the precious fluid, is carefully drawn our between the thumb and finger and laid aside to dry until the work is completed.

At first, the thread is of a dull blue color, but upon exposure to the atmosphere, acquires the desired tint. The fish is not destroyed by the operation, but is returned to the sea, where it lays in a new stock of coloring matter for a future occasion."

A variation of this method is reported from the other side of the Pacific from China, the only one of its kind I was able to find. The record read: " T They pick out the snails a certain purple-colored substance which they use in coloring and in making red-ink- then they eat the snails."

Returning again to our side of the water, it would seem most natural to suppose that these processes were taught the people here by early immigrants from the Mediterranean shores, were it not for much evidence, too complicated to be given in the limits of this paper, that they were brought over from Prae-Columbian times, along with Pearls and Tritons and other evidences of religious significance.

In the Americas, not alone was purple made use of for dyeing fabrics; for very ancient parchments of purple and gold have been found, and found amid such surroundings as to leave little doubt that the art was brought to ancient Mexico and Peru; and the similarity of such manuscripts in both hemispheres, shows them to be of ecclesiastical origin.

But, however sacred the Purple may have been held in ancient times, or may have continued to be held later, trust sacriligious moderns, or comparative moderns, to make profane use of it. So we find that, though its use started in the temples as a part of their ritual, outsiders took it up for other than religious purposes. Even in Old Mexico, not only did they put purple in their sacred manuscripts, but on their faces,as well: while in Egypt, Cleopatra, when all dressed up, may quite likely have been seen wearing a necklace of golden snails and also, with her lovely countenance enhanced, for Anthony's further suggestion, by purple rouge and lip-stick. Search has not yet made available an authentic record of an ancient purple nail-polish.

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Dr. A. Myra Keen, Stanford University, advises
" The exhibit of deep-water invertebrates (350-400 fathoms) from Monterey Bay which Mr• John Strohbeen had at the A.M.U. meeting at Pacific Grove was donated by him to Stanford University and is already on display on the ground floor of the Geology Building. Mr. Sorensen also donated an interesting large glass sponge which is included in the new display."

* Note* This was a beautiful exhibit covering an entire large table. Mr. Strohbeen also had numbers of pieces of an interesting gorgonian which he was giving to all interested. This is one of the unhappy thoughts of this editor. He neglected to get his specimen. The A.M.U. meeting was a bit on the order of a four ring circus. There were so many things going on that it was almost certain that you would miss some of it.

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The Academy of Natural Sciences, 19th and the Parkway, Phila. 3, Pa.
We have a card advising: " The Academy has a limited supply of its Special Publication #3 which it is offering at the following price (subject to prior sale). #3 " Gabb's California Cretaceous and Tertiary Type Lamellibranchs" by Ralph B. Stewart. Price ... $7.50.

* Note*. We have made many references and quotations from this work and it is an essential in any good west coast conchological library.

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The June Bulletin of the California Academy of Sciences contains a laughable account " Willie the Octopus-- os Is He ?". Willie is a new Octopus in the Steinhart Aquarium and he has but 7 arms with no indications that he ever did have more than 7. The bulletin editor humorously asks " Just seven arms- no more, no less. Does that make Willie a Septipus? "

This editor of the little monthly bulletin should write a book of his observations. They would not only be informative but the reader would get some hearty laughs along with the knowledge. His little notes about the bats for example entitled " Bats in Our Belfry" " Now a grown up bat is nothing to brag about for looks; but a bat-infant is really astonishingly unattractive"

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A Four-winged Specimen of Pterynotus trialatus (Sowerby)

Mr. Jack W. Brookshire and Conrad C. Limbaugh while diving at Balboa just inside the entrance to Newport Bay brought up some beautiful specimens of this fine species. Among them was an exceptionally large specimen with four wings. The collectors had it at the recent meeting of the Conchological Club and it attracted general interest and admiration because it is certainly in no way deformed but a beautiful shell in any collection. The possibility of it being of some taxonomic significance was discussed by those present.

The following observations on this shell were made by Mr. Jack W. Brookshire, one of the collectors.

Significant differences Between the assumed mutant P. trialatus and the typical form. By Jack W. Brookshire.

1. Four definite diametrically opposed varices as compared with the usual three in typical trialatus.
2. Aperture much larger with an obvious departure from the usual limits of variation within the species. The operculum is correspondingly distorted.
3. Readily apparent basic wing structure. An easily recognizable difference.
4. Dentition totally (or nearly so) absent with also a lack of the raised aperture rim which is a notable characteristic of P. trialatus.
5. Absence of the inter-varix bumps invariably found on trialatus, especially on the first 3/4 inch of the spire.
6. Evident marking differentions.
7. A sort of cordlike ridge running about the middle of the whorl brought about by simultaneous distortions in two planes.
8. Varices much befrizzled above the ridge mentioned above and surprisingly smooth below it.
9. Lastly, each succeeding varix is formed in front of the varix on the preceding whorl whereas in the case of the normal P. trialatus each succeeding varix is invariably placed behind the one above it.

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The Puget Sound Oyster Bulletin, Ser. VI; No.3, June 27,1947 from the State Shellfish Laboratory, Gig Harbor, Washington contains some interesting information along with the reports on the native oysters. The item that caught my interest was "Experiment on Raft Culture of Oysters "

" Culture of oysters to marketable size suspended beneath floats or rafts is commonly practiced throughout the sheltered bays in Japan. Rafts are made of tarred wooden barrels or fifty-gallon oil drums and a flexible framework of small poles. Seed oysters attached to oyster or scallop shells like those exported to the United States this spring are strung on heavy galvanized wires six feet long, with the shells about four inches apart and separated by bamboo spacers. In some cases two strands of tarred rice rope are twisted together with a shell spaced every 4 to 6 inches making strings about 6 ft. long. These strings of shells are hung vertically below the raft and spaced 18 to 25 inches apart. " Advantages are freedom from drills, star-fish, crabs etc. faster growth in warmer water etc. The experiment in Puget Sound will be watched with interest.

RICHARD B. HINDS AND THE VOYAGE OF H.M.S. SULPHUR

by Effie M. Clark

Finding out about Richard B. Hinds as a conchologist has been for me a very elusive pursuit. As a botanist I had better luck, as from his own account he had submitted a paper covering the voyage to a noted English botanist and it came out under the publications of the Kew Gardens, I believe. It does not seem to be available here in the Los Angeles libraries. Thanks to a very obliging librarian at Merced I was able to obtain the account of the Sulphur voyage in which he has a paper of some 130 pages in which he divides the botanical regions of the earth into some eighteen regions, giving quite full lists of the genera to be found in each, but never a word as to the fauna.

The book bearing the title " A Narative of a Voyage Round the World Pursued in Her Majesty's Ship Sulphur During the Years 1836-1842 by Sir Edward Belcher R.N. KNT, C.B., F.R.A.S. and there are but four references to Richard Hinds They read as follows: p. 44, vol.I, " I set off immediately accompanied by my assistant surgeon, Mr. Hinds and Messrs. Simpkson and Nichols, midshipmen." p. 211 " Our party consisting of the consul, Gen. Wright, Lieut. Kellett, Mr. Hinds, assistant surgeon, Mr. Richards, midshipman, and myself quitted Guayquil in our pinnace on the evening of the first of October for Bodegas, and reached the house of General Flores on the following evening."

A footnote on a page under the discussion of the Flathead Indians reads: " This as well as the following detail relative to the compression of the skulls were kindly presented by Mr. Hinds, assistant surgeon." On page 342 we are informed of the fact " Quitting the ship, accompanied by Lieutenant Kellett and our surgeon, Mr. Hinds, we reached Tepic the following morning." The wording might give rise to a suspicion that our friend Richard had received a promotion, though there is no other evidence in the book to corroborate it.

On the very last page of volume 2 a whole paragraph is devoted to Hinds as follows: " The department of natural history has been distributed amongst its various competent and distinguished laborers, under the superintendence of Mr. Hinds, and I trust will shortly follow my humble records." " Humble records" is a priceless description of the 700 pages devoted to the down sittings and uprisings of our British friend who was in no sense a shrinking violet. I think, however, he did know something about conchology from chance remarks he dropped here and there.

I read the book from ' kiver to kiver' with considerable enjoyment, a feat that would have been impossible had I not been on my vacation and without the kind offices of the Merced county librarian who obtained the book for me from Sacramento.

From my perusal I gather that Sir Edward, who was then only Captain Belcher, stepped into the shoes of another, Captain Beachley, who had been at the head of a surveying expedition and whose health had failed so greatly that he was invalided home on reaching Valparaiso.

The Sulphur was a sailing ship of 180 tons, with a crew of 109 men that had been sent out together with the Starling, a slightly smaller ship, commanded by Lieutenant Kellett, to survey and correct charts, principally in the Pacific from Valparaiso to 60 degrees and 30 minutes N. latitude.

The two ships left Plymouth Dec. 24, 1855, and after Captain Beachy's illness, Kellett took command till they reached Panama in the latter part of June where Belcher joined them, having come from England in a steamer and crossing the Isthmus by a difficult route that caused considerable annoyance and hardship to our author, or shall we say hero ?

When Belcher took command, Kellett went back to the Starling and followed always slightly in the rear, in Belcher's narrative. In the reading of it, however, the thought more than once obtruded itself that when there were things to be done or dared, Kellett was always right on hand or a wee bit ahead of his superior officer. Pages and pages are devoted to the difficulties of getting supplies, they must have been trully beef eaters from the number of bullocks he listed among his purchases.

They followed the coast up to San Blas, then set out for the Sandwich Islands, hunting up a few doubtful islands on the way, and reached their objective July 7th. Captain B. liked the islands and their climate, but he distinctly did not like the missionaries or any of their ways or plans. Neither did he particularly like the American mariners or the American influence in the islands. According to his accounts they could not seem to do anything just right. Perhaps their greatest annoyance to him was the poor quality of their rum and the difficulty he had in getting ~~as much~~ as he wished to stock his shop. He had a finger in several pies while there then sailed away to Alaska much to the relief of the missionaries, I surmise. A Russian fur company was in charge of what government there was at the time and intimated that the British might do a better job of it. He was evidently a mixer, both socially, if not politically, as well. He was in a few scraps then moved on own the coast , planning to look into the navigability of both the Columbia and the Sacramento rivers. He has much to say of the seawoeds he encountered in various places and called themall by their scientific names, and he spoke often of fossils that he found in vatious places. He found conditions down the coast in a serious plight, but did not stay long for the rains were beginning and interferred with his work, so he went on down to San Blas for his yearly mail. It was not there, neither was it in Panama, but he read, in some papers he found in one of the ports of the coronation of Queen Victoria to his apparent great delight.

Earthquakes and cholera made things quite unpleasant for them on the coast of Central America. Meanwhile Kellett with his Starling succeeded in rustling the mail from somewhere. They were somewhat mixed up in a South American revolution, but got out without serious damage. They went down as far as Peru, where they watched pearl divers bring up at one time from 10 to 17 oysters as big as dinner plates, without any other equipment than that provided by Mother Nature. Belcher did not rate the pearls very highly, however. Speaking of this region he says, " In conchology several rare shells (particularly *Tellina burnetti*) were taken, but this gulf (G. of Fonseca) is very poor in respect to quantity or variety. Erom here they sailed again to Honolulu, where Belcher found his love for the missionaries had not grown stronger by absence. In due time they went back to Alaska and again down the shore, exploring and charting the coast. Of one region he remarked, " During my delay on the shore, the dredge was put out and some interesting specimens from 35 to 50 fathoms were obtained, amongst them several living *Terebratula*. He explored the lower part of the Columbia and Sacramento rivers this time, then went down the coast stopping at Santa Barbara , San Pedro, and San Diego on down to Mexico. At the Gulf of Magdalena he reports finding the summits of sand hills evenas high as 50 to 60 ft. above the tide line, covered with perfect, though fragile shells, principally of *Arca*, *Venus*, *Cardium*, and *Murex*. When *Ostrea* appeared they were by themselves. He again visited San Blas, getting his mail this time. They then set out for a tour of the south seas, where in the course of their jaunt they had several scraps and where, with a single exception, our friend found nothing to increase his admiration for missonaries .

Of Sumatra he said, " As we were just in 100 fathoms of water and becalm the dredge was put over to try for anything livingat that depth. We were particularly successful in obtaining live specimens of Terebratula, Chama, and minute shells of Echini and Asteria."

Of another dredging experiment he said, "At 100 fathoms very acceptable fish of the porgy type were hooked, and 9 univalves, 5 bivalves, 3 euryal and several Echini were obtained by the dredge from 65 fathoms sea at 64 degrees, bottom 62 degrees and evidently fossil."

Again he says, " On the 12th of April,1842, being becalmed in a fog about 108 mailes off Cape Hanklip, the dredge was dropped to 70 fathoms, by which many very interesting specimens were procured, particularly Terebratula which occured alive and in great variety. "

On his way home, going up the coast of Africa he says " During our detention near the equator, we were fortunate in obtaining very large and perfect specimens of the Helixjantha, as well as several beautiful varieties of Nautilus, hyalea and Cleodora."

After considerable fighting in China (I was unable to figure out just what it was all about) Belcher took the Sulphur and all of Kellett's men leaving the latter in command of the Starling to go on surveying (and fighting if need be) while he went home. It was a promotion for Kellett but he had wanted to go home after six years of sailing. Belcher says nothing more concerning him and one is left wondering what he did while Captain Belcher took the Sulphur and went back to England to become a Sir and write 717 pages to tell his story.

All these things happened a century ago, but still make interesting reading.

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* Note* The book with which we have the greatest interest is " The Zoology of the Voyage of the H.M.S. Sulphur under the command of Captain Sir Edward Belcher, R.N.C.B.F.R.G.S. etc. during the years 1836-42." Vol. II, Mollusca, by R.B. Hinds, Published in 1844.

This work is so exceedingly rare that while it is possible there are other copies available on this coast the only one I know of is in the library of the California Academy of Sciences in San Francisco. However, the plates have been photographed from this copy and a few yearsago we made a number of photostatic copies of the plates and accompanied them with typewritten copies of the explanations of the plates.

We recently disposed of the last of these but there are a number of them about now and more copies could easily be made from the negatives if enough persons were interested to bother with it.

* * *

The University of Havana, Havana, Cuba is offering a course in malacology during their summer session, July 7 to August 16. The course is under Dr. Carlos Guillermo Aguayo and the outline would interest all of us in registration if that were possible. Methods of classification of both land and marine species and genera, exercises in dissection for establishing characters and classification, preparation of radulas, cataloguing, preparation of specimens, museumology, and any number of field trips under expert leadership.

If there is a similar course offered by any university in this country I have never heard of it. Our neighbors in Cuba are to be congratulated if not envied.

* * *

The law of Cuba prohibiting the exportation of Polymita other than for scientific study should perhaps save the species from extinction. Their use for manufacturing ornaments has reached a wholesale stage.

THE LOWER SAN PEDRO FORMATION

by Effie M. Clark

The first thought of one assigned a topic like this would quite naturally run parallel to that of the cook who was writing a receipe for rabbit pie- or was it stew ? At any rate, he began it " First catch your hare."

In days gone by, but yet in the memory of some club members, Deadman Island stood out, in what was then San Pedro Harbor, like a very large and impressive showcase, proudly exhibiting its geological wares to all who cared to look at them.

The rest of us who have never had the pleasure of viewing that graphic illustration of " The March of Time", before Man took a hand in its management, most sincerely regret that " The Powers" then in charge of the harbor's development, could not have found some other way to safeguard navigation, without destroying that most interesting landmark.

Since they did not do so, we may be very glad, indeed, that, before its removal, Arnold gave us a careful description of the island accompanied by a number of excellent pictures of it.

The name of this memoir, published in 1909, is " Paleontology and Stratiography of the Marine Pliocene and Pleistocene of San Pedro, California" Therein he named Deadman Island the type locality of the Upper and Lower San Pedro series.

The lowest exposure he found there- one of unknown depth, because it extended down into the harbor bed- he called Miocene, reporting it to consist principally of jointed shales. That would presumably be a warm water deposit, but he recorded the finding of no fossils to prove the fact.

Directly on this laid what he called " contact stratum". It was about a foot in thickness, composed chiefly of water worn shale pebbles, some of which were pierced by worm and Pholad holes.

This stratum varied from 20 to 40 feet and was composed of brown,clayey sandstone. Its layers were of differing thicknesses and inclined at different angles showing that there had either beena gradual tilting as the deposit was formed or that the material had been laid down on a sloping bottom.

Above the, sometimes pebbly, sandstone was a layer of brownish yellow, clayey sand, in some places changed by exposure to sea water toa blue grey clayey soil, some places filled with well-preserves shells, but at the southp-west corner the strata were hard brown sandstone with very few fossils.

About four feet of fine dark brown sandstone was above this. It was hard but porus and contained many well preserved fossils while in the lighter colored places among them were fragile fossils and poorly preserved. He noted as very common in this deposit both *Lucina acutilineata* and *Thyasira bisecta.*

Above this was a stratum of from 25 to 30 ft. in thickness,and not very full of fossils. It was of brown sandstone and differing appearance in the different parts of the layer, being softer and lighter colored below, becoming harder and darker colored higher up.

He reported the same formation as occuring at Timm's Point, only about one-fourth mile away to the west. He believed it to be a boreal formation and identified on the island 87 species, 55 of which he knew to be living at San Pedro, 16 to the north and none to the south.

At nearby Timm's Point he identified but 28 species. The fact that so many more have been found by other collectors later is due to excavations made since that time exposing so much more of the formation.

Above the strata described he found two other well defined ones which he named the San Pedro series. The lower one was given the name Lower San Pedro.

On Deadman Island, this was from 4 to 40 ft. in thickness, not all uniform in composition nor uniformly fossiliferous, but, nevertheless, yielding an abundance of beautifully preserved fossils. Here he identified 247 species, 158 of which were known to be living at or near San Pedro, 43 only to the north, and 8 only to the south. From the nearby bluffs, in what he regarded as the same formation, he identified 140 species, 14 of which he had not found at Deadman Island. He believed this, too, to be a cold water formation, but, perhaps, not quite so cold as the one directly below it.

The upper stratum of the San Pedro Series he named Upper San Pedro. This he found on Deadman to vary quite considerably in character from those below it, being sometimes gravelly and sometimes hardened by calcareous cement. It lay about 6 feet below the surface and was from two to three feet in thickness. In it he found sometimes sand and sometimes water worn pebbles of Miocene shale with many Pholad holes, often containing shells.

From this formation he identified 153 species, while on shore, further to the north, in a location he called the Lumber Yard, he obtained 252 species, 172 of which were known to be living at San Pedro, 15 only to the north and 36 only to the south, all of which pointed clearly to the fact that a warm water fauna was living there at the time of the deposit. The Lumber Yard, by the way, has all gone into roadsand paving, but the bluffs behind it contain some, at least, of the many shells he found there.

At Los Ceritos, now called Signal Hill, he collected 160 species. All in all, from all sources in this region he lists over 400 species of fossils.

Topping the island, in the six feet or less of recent soil, were many Recent shells, all edible species. Such formations, often of great thickness, are to be found all along this, as wellas other California coast regions, and furnish conclusive evidence that " The Noble Red Man", in his day on out shores, not only knew his mollusks but ate them enthusiastically.

In 1924, 21 years later, T.S. Oldroyd presented a paper entitled "Fossils of the Lower San Pedro Fauna of Nob Hill Cut". In this he describes a cut of 20 feet made in a street excavation, by which was exposed the lower strata where it was not overlain by the upper one, so there would be no mixing of the two faunas. Here he identified 242 species, all but 35 known to be living, and 115 of those living to be found at, or north of Puget Sound. This certainly agrees with Arnold's claim that it is a cold-water fauna, but certainly cast doubt on his estimate of geologic time.

Five years later, in 1929, just before Deadman was blasted away, C.H. Crickmay presented a paper titled " The Anomalous Stratiography of Deadman 's Island of California". In this he recognized 8 zones above the Miocene formation and probably identified more species than Arnold had found there, though I have not had opportunity to verify this, if, indeed, he made a record of the number collected.

Just who first assigned the deposit just above the Miocene to a later age than the Pliocene, I was unable to find out, but the growing number of discoveries of what had been considered extinct species to the north or to the south, or to deep water nearby, slowly forced the estimated time when the deposits were made to a later age.

The next year Woodring published a paper entitled " Warm-Water Fauna of the So-called Pliocene of San Pedro", and the year after that , Grant and Gale in their " Catalogue of Pliocene and Pleistocene Mollusks of California made quite a different classification of the San Pedro strata which, with profound apologies to the authors, I have tried to show in chart form, and in which I hope I have not misinterpreted their meaning.

In the same year, and only a month later, Alex Clark presented a paper entitled " The Cool-Water Timm's Point Pleistocene Horizon at San Pedro, Cal."

the nearest point to what had been Deadman Island. He had much better access to the strata there than had been afforded to Arnold when he made his report, though he probably ground his geological teeth when he came up against the stone wall that shut away so effectually, the formation just where it was dipping down to where it could be studied without ropes or ladders or "cricks " of the neck. He listed 155 species, 11 of which he believed to be extinct. He did not find the formation there to agree exactly with Arnold's description, which would not be surprising, due to the greater depth of the more recent excavations, but in many ways it fit in with Crickmay's zones. He made a very interesting chart, which I have tried to reproduce, showing the correlations and differences of his, Crickmay's and Woodring's findings.

To Clark's list, in 1937, Mr. George Willett added 20 new names, two of them new species, and he has since described another from another exposure of presumably the same age, which he alone has found at Timm's Point. In his paper he suggested, and many of us know from our own collections, that some fifty other species are waiting the publication of their names in Timm's Point's " Who's Who".

Lower San Pedro is to be found outcropping at many places in and around San Pedro. One very interesting place is the one Arnold called " Crawfish George's" or " Old San Pedro", just to the south of the street north of Fort McArthur that leads to the Navy Landing. It is my No. 1 locality. No. 1 is a really interesting place to work, if you do not mind hanging on by your eyebrows while you do it. If you should happen, as I once did, to have along with you , a good friend like our path-making brother Edmonds, the work is much easier and the results much more profitable. Once when I was working there, some soldiers on guard at the fort came over to warn us of a couple of sneak thieves who were trying to get our lunches and purses. Having driven the marauders away, they sat down to chat about this and that, and they told us of a much better exposure inside the fort, offering to guide us to it. However, the day was too far spent and we had a bus to make, so we reluctantly declined their kind offer, much to my later regret, when, without theaid of the army, I tried to find the place and it appeared to be all covered with cement.

In trying to find Crawfish George's from my description, Miss Cook once turned north instead of south of 22nd St., where she found some fossils, but complained that they were hard to getat. In that respect, at least, her location seems to resemble George's.

Oldroyd reported finding Lower San Pedro at " Nob Hill". I found lots of things including a perfect Oregon Triton (Fusitriton oregonensis (Redfield) at what I suppose to be what is left of Nob Hill, but whether I was collecting Upper or Lower San Pedro, or both, Iam unable to say.

There are many interesting things at 8th and Palos Verdes Sts. in the heart of San Pedro, and theyare very easy to get at, but I hardly think they are Lower San Pedro, though I did find a bit of the new Alabina there. For a would be delver into Lower San Pedro, the chances are better ay " Hill Top Quarry", for many of its most characteristic species are to be found there, along with a lot of surprises that make it, for me, the most fascinating place to exercise a sifter.

Let me sound a warning, as you go in from the east to beware of a German who may attempt to blitzkreig you if you attempt to go through a gate in front of his house, and which he seems to think it is his mission in life to guard most gruffly.

As is almost always the case there is another way in, but I am not qualified to direct you properly to it; you will have to go to Scoutmaster Edmonds for that information.

Of course, I am not trying to run down Timm's Point. It is easy to get at, and, if you do not mind carrying heavy loads uphill, and if it does not break your heart when you see beautiful fossils that make your mouth water melt like magic before your eyes, as you ply the hose to remove the tenaceous sandy clay in which theyare so firmly imbedded, as I said before, and as Lincoln almost said " If you like that kind of thing, that will be a place you will like."

I remember once of spading with the Burches, what I called a perfect Fourth of July. We spent an exciting forenoon visiting six fossil locations, taking their pictures and whatever else we could lay our hands on. Then I spent a blissful afternoon, playing the hose on the great hunks of Timm's Point we had brought home in the trailer while Tom did the heavy work.

Now I have an immagination of sorts, so while I sat enjoying myself, I conjured up a vision of another " fourth" that would be the very height of something or other. That would be to sit all day long at the foot of Timm's Point exposure, hose in hand, and watch the good ones come tumblihg down. If anyone can think of a more perfect conchological spree, just name it, please; it ought to be good.

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Mr. D.L. Emery, 121 20th Ave., S., St. Petersburg, Fla. paid us a visit and we enjoyed a pleasant afternoon chatting about shells and shell people as welll as acquiring shells from each other. Mr. Emery brought some very welcome additions to our collection. He evidently went from here on down to San Diego because we have a note from,

Miss Viola S. Bristol, Natural History Museum, Balboa Park, San Diego, Calif. telling of what sounded like another malacological convention there with the following around the table: Mr. Emery, Mr. and Mrs. Webber, Maxwell Smith, Dr. and Mrs. Baily.

Biologia- is a publication we have been receiving recently. It is from the publishers of Charonia Botanica, P.O. Box 151, Waltham 54, Mass. It states that it is " An International Bimonthly Biological Newslatter " The annual subscription rate for Biologia is $1 or $4 for one volume. While this is not advertised in any way I think that their policy is to send a sample copy to anyone asking for it. However, you had better not do this unless you have your check already made out because this little paper seems to contain more interesting current information than anything published. It not only lists the activities of the principal societies, congresses etc. of the world but also mentions new publications frequently of great interest. Most of us are amazed at the number of publications we have overlooked when we receive the Zoological Record of the Zoological Society of London. Of course, Biologia does not seem to go into the detail of the Zoological Record but it does list the major publications at least and as you know the record is always a year or two late. If you are not now receiving this publication you are really overlooking something. Of course, Charonia Botanica has made itself a necessity in its field.

Postage Stamps- We are not much interested in philately but know that some of our members are. A new publication of the U.S. Post Office Department has been announced this week. It is quite a book 163 pages and describes every postage stamp issued by the Post Office Department from July 1,1847 to May 31,1947. And for a mere 45¢. Write the Superintendent of Public Documents, Washington, D.C. and ask for Catalog No. P 4.10:947. 45¢.

Mr. and Mrs. Howard Gilmore are now at their summer address "The Hedges" Chesham, XX New Hampshire.

Mr. and Mrs. A.C. Bippus, 1918 Bayard Place, Toledo 6, Ohio. We were very happy to have them with us at the last meeting of the Conchological Club and only regret that their visit in southern California is to be so short.

Financial Report to the Conchological Club on the Minutes

The editor has just completed a report showing Expenses- $1675.35 and Receipts- $1688.02. At least we are not in the red ink even though the balance on hand of $12.67 is not too impressive. However, our mailing list is steadily growing and our paper is literally going all over the globe and to most of the large institutions of the world.

A few of the difficulties may be briefly mentioned. In the first place it has been said recently that paper is the only ' black market' left. We thought we had trouble during the war years when paper was higher priced every time we ordered, but now good mimeograph paper is simply not to be had at any price. We use what we can get and ' like it'. We usually buy in lots of 320 reams which should give us some consideration some might think, but it seems that the dealers prefer smaller orders to more customers in these days of shortage.

The editor is frequently asked when we are going to resume printing our papers. Last month we were given a quotation by one of the largest printers in Los Angeles, and when your editor hastily explained that we did not really wish to ' buy' the printing plant but just to have a little printing done, the attempt at humor was coldly received. Unless we discover an 'angel' we will be lucky to continue mimeographing.

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The Long Beach Shell Club met on June 8,1947. The speakers of the afternoon were Mr.and Mrs. H.R. Turver who gave very interesting talks illustrated by beautiful shells and photographs from their trips to Guaymas, Mexico. One new member was received- Pearl Conner, 334 West 6th St.,Long Beach

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E.J. Post, R 6, Box 283, Tampa, Florida. Note the new address. Glad to hear this though. " Iam feeling fine." " Our rainy season is on now- have had 6.13 inches of rain in June. It is too hot for me to get around much."

Paul P. McGinty, Boynton Beach, Florida. " My two sons have just returned from a Bahama cruise of nearly a month. It was quite an adventure considering that they covered all that open ocean in a small thirty foot motor-boat. They collected for a week or so around the islands of the Bimini chain, then went over to Andros Island, the largest, but one of the least known of the Bahama Islands. They are still raving about the marvelous coral reefs which lie to the east and along the edge of the great depths of the " Tongue of the Ocean". Before returning they ran over to New Providence Island and Nassau and did considerable shell hunting upon the Cays in this area. Since they had equipment for just about every known method of shelling (diving, rig, goggles, dredge, traps etc.) they brought back some splendid material. " Johnsonia" readers would be particularly interested. Wish you folks didn't live so far away, We's sure have enjoyed being out there for the A.M.U. doings. I know that you all had a grand time."

Dr. Thomas A. Burch, and family, Beatrice and the two children John Q. III and Ruth Janthina are back in Guatemala City. Duties of the National Institute of Health will keep them in Central America for perhaps a year.

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BOOKS

Roughley: Wonders of the Great Barrier Reef has been delivered. $5.00
Roger Torey Peterson: A Field Guide to the Birds is also ready now. $3.50
Your orders will be given prompt attention by,
John Q. Burch, 4206 Halldale Ave., Los Angeles 37

EAST OF THE ANDES AND WEST OF NOWHERE

By NANCY BELL BATES 1947 $3.50

A NATURALIST'S WIFE IN COLOMBIA

Nancy Bell Fairchild grew up with a liking for the limitless range of adventure that waits for the purposeful explorer, for she is a daughter of David Fairchild, the world prospector for plants. And she grew up with a taste for the fascinations that await the explorer in science, for her grandfather was Alexander Graham Bell, inventor of the telephone, the aileron, and many other things. And when, after some adventuring on her own, she married the naturalist Marston Bates, the two interests were fused, for her husband was destined to live and work in remote places in field research for the Rockefeller Foundation's fight against disease. Her marriage took her to a country of " far away and long ago" and into a wonderland of science.

The Bateses are at home in Colombia. To get where they live, if you want to follow the route that Mrs. Marston Bates took when she first went out, you climb the Andes by train and motor from the Pacific side, to Bogotá, at 8500 feet. (She tarried a few months while she had the baby that was expected). Then you go on eastward by motor road, down, up again, until you top the last range and start down the eastern side of the mountains, praying that there will be no landslide. Suddenly, far below, there is a breath-taking view of the country that awaits you. And eventually you come down to the little town of Villavicencio, to find yourself east of the Andes and almost literally west of nowhere. For you are at the edge of the " llanos", the vast, grassy plains touched here and there with jungle, which stretch boundlessly eastward, descending gradually to jungle that is absolute and trackless. (Open an atlas and just try to find even a handful of towns in the big open space toward the top of the map of South America.).

This is the story of life in an unfamiliar land, told with a delightful informality, told humorously, intimately. It is full of strange sights, strange animals, strange household pets, strange customs- for a day's saddle journey out from Villavicencio will take you straight into the seventeenth century. In some of the most engrossing pages of all, Nancy Bell Bates initiates you into the fascinations of " The Boss's" share in the battle against yellow fever. Mrs. Bates has been one of her husbands assistants in his Rockefeller Foundation research.

48 pages of illustrations from photographs.

* Note* This new book is now in the press and delivery expected soon. Your order appreciated by John Q. Burch, 4206 Halldale, Los Angeles 37.

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CONCHOLOGICAL
CLUB OF SOUTHERN
CALIFORNIA

Subscription $2.50 per year

We are now meeting the first Tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, California. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Telephone Ax. 2-7965

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? Tapes philippinarum ?

At the recent Pacific Grove meeting of the American Malacological Union a paper by Professor Trevor Kincaid of the University of Washington was read. In this paper Professor Kincaid called attention to the fact that the newly introduced exotic species from Japan is hybridizing freely with the native west coast Protothaca staminea. We had a set of these hybrids sent us by Professor Kincaid and we were puzzled by them at the meeting of the club a month or two ago. An interesting development is the following personal communication from Dr. A. Myra Keen.

" I have been working over the problem of that introduced clam we have been calling Tapes philippinarum, having realized that something must be wrong with our classification if it hybridizes freely (as Dr. Kincaid reported in his paper) with Protothaca staminea. Don Frizzell, who specialized on Protothaca, happened to be here last week and together we went over the material in the Stanford collection. We agree that the introduced form has been misidentified by the Japanese and others, that it is not T. philippinarum (Sowerby) but that it is a Protothaca instead. The earliest valid name seems to be Protothaca semidecussata (Reeve),1864. I have written Dr. Kuroda to get him to make more comparisons of Japanese with Philippine material."

The paper that caused the above discussion follows.

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The Acclimatization of Marine Animals in Pacific Northwest Waters

By Trevor Kincaid, University of Washington

The introduction of foreign animals into our local waters has proven of considerable interest from several points of view. Some of these have proved to be of great economic value, while others are highly detrimental.

From the biological standpoint the problem is of great interest, since it is obvious that a number of ecological factors have to be brought in line in order that the invading species can be successfully established in its new environment. The physical conditions such as temperature, salinity, tidal movements, must not range beyond the powers of endurance of the organism. Suitable food materials must be available. Potential enemies must be absent or present in limited numbers. The number of individual animals must be great enough to ensure reproduction. If too few are present, and especially if the species is of a migratory type, the individuals become so scattered that mating may not occur. In sessile or non migratory forms a relatively small number of individuals may be effective. The ability of the organism to survive for a greater or less periodof time while in transit is another important link in the chain of survival factors. Modern means of swift transportation have made it possible for many organisms to leap barriers of space which would have been impossible in an earlier age.

In the case of the mollusks the first attempt made to introduce a useful member of the group into the waters of the State of Washington was a failure,but led to a number of secondary results of an unexpected nature. During the nineties considerable shipments of small seed oysters were made from the Atlantic coast and planted in Puget Sound, and Willapa Bay.Great hopes were entertained that an important industry might be built up along this line. Unfortunately the low summer temperatures which prevail in almost all portions of the area in which plantings were made inhibited the spawning of the oysters, and thus made their establishment questionable, while the exposed flats on which most of the plantings were made proved unsuitable for the Atlantic species and as a result the attempt to commercialize the animals was given up. In several areas, suchas the estuary of the Naselle River in Willapa Bay and similar waters in British Columbia, reproduction actually occured and the species might have been established, but no attempt was made to conserve the nascent colonies and they were lost.

In connection with the shipment of oyster seed from the Atlantic coast sev several mollusks were introduced which established themselves and eventually spread over a wide territory. The Atlantic soft shell clam *Mya arenaria* now ranges from California to Alaska, but is little used commercially. In some areas where it was formerly veryabundant it has died out for some unknown reason. Unfortunately another " fellow traveller " with the clam was the slipper shell *Crepidula fornicata*, and this has proven a great nuisance to the persons engaged in the production of the native oyster, *Ostrea lurida*. Another pest introduced in the same manner was the eastern *oyster drill*, *Urosalpinx cinerea* which follows the same destructive tactics as in its *native haunts*. Two additional mollusks reaching the coast by the same agencies but quite inoffensive are *Petricola pholadiformis* and *Nassarius obsoletus*. The two latter species do *not seem to be present in Puget Sound but are* abundant in Willapa Bay.

The introduction of the large oyster native to Japan known generally under the name *Ostrea gigas*, but more properly called *Ostrea laperousii* Schrenk, into *our coastal waters* has led to the *arrival of a number of* oriental molluscan immigrants, some of them of the most undesirable character.

Most of the early shipments of seed oysters from Japan were planted in the Samish Bay region immediately to the southward of the city of Bellingham. No effort seems to have been made by the Japanese shippers to free the seed from undesirable organisms and on several occasions large numbers of mollusks and other organisms arrived in a living state and were deposited along with the young oysters upon the mud flats. (con.)

In the summer of 1924 the attention of the writer was called to conditions that had resulted from the shipment of a mass of oyster seed that had arrived from Japan early in the spring of that year and had been planted in Samish Bay. The seed oysters along with the accompanying debris had been deposited within an area subtended by a low concrete diking wall. The wall itself was literally covered with a great number of gasteropods of several species, while several species of bivalves were present in the bottom material. The list of those mollusks taken on this occasion is appended, with such notes as may seem applicable.

1. The most serious of the new arrivals was *Ocenebra japonica* (Dunker). It is the so-called Japanese Drill. It has gradually spread to all of the oyster growing areas north of Grays Harbor and Willapa Bay and where it has gained a foothold has proven very destructive.

2. *Lampania zonale* Brug. This species has become completely acclimatized and has developed in enormous numbers on the shallow sandy flats near the shore. It has extended its range into some of the neighboring bays but has not "jumped" to any other district so that its range is still continuous. It does not seem to be harmful so far as has been observed.

3. *Paphia philippinarum.* This small clam was among the early intriductions and owing to its pelagic larval existence it has spread far and wide and is now present in all of the oyster growing areas in large numbers. It was first observed in Willapa Bay in 1947, but has probably been there for some time. It seems to cross freely with the related local species *Paphia staminea* and all sorts of intergrades have appeared. Either in its pure or crossed form it has become a conspicuous element in the catch of the local clam diggers.

4. *Trapezium japonicum* Pilsbry. This species has bceome widely dispersed and is found in all of the oyster growing areas, including Willapa Bay.

The following species were taken in the living state in the area where the Japanese seed oysters were planted in 1924. Whether any of them have become permanently acclimatized is not known. The site has not been studied for many years but may be gone over during the coming summer in search of survivors.

5. *Turbo marmoratus* L. Only a few of these were taken.
6. *Turbo coronatus coreensis* Red. Fairly abundant.
7. *Monodonta labio* L. Abundant.
8. *Thais* sp. I am uncertain as to the identity of this form. I have notes that indicate that it is *Thais tumulosus.* Another note indicates that it may be *Thais nodulosa* var. *problematica* (Baker). If the Japanese *Thais* are anything like our local forms I am not surprised at a mixup in names. Possibly John Burch can straighten me out on this.
9. *Acmaea heroldi* var *signata.* Abundant.
10. *Modiolus senhausi* Reeve. Abundant.
11. *Pododesmus* sp. A species appeared in the collection that seems somewhat different from the local *P. macroschisma,* and since this last species seems to be extremely variable the specimens presented may not be imported forms.

In connection with the above I note that Mr. G. Dallas Hanna writing in the Bulletin of the Department of Agriculture, State of California under the title " Exotic Mollusca in California" gives a list of some 23 species which appeared in a shipment of Japanese oyster seed planted in Elkhorn Slough, California. So far as is known none of these became established. The date of the shipment is given as March 26,1930.

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Turbo saxosus Wood and Turbo fluctuosus Wood

At a recent meeting of the Conchological Club Mr . and Mrs. Harry Turver had a beautiful exhibit of west Mexican material on the tables. At that time John Q. Burch commented upon the fact that there seems to be a great deal of confusion between the two species of Turbo and the problem was briefly discussed. It is certain that many collections have these two species mislabelled. The matter was mentioned to Dr . A. Myra Keen whose opinion follows.

" As to the Turbo problem: True T. saxosus Wood is a Panamic shell which is distinguished from T. fluctuosus Wood not on the basis of the noded shoulder but by the noded sutural collar. Also, it has a rather scaly surface. There seems to be a distinct break in distribution of the two species,,T. saxosus being restricted to the southern part of the Panamic province, T. fluctuosus to the northern. This is the distinction drawn by Pilsbry in the Manual of Conchology and followed by Pilsbry and Lowe. I do not have Wood 's original figures to check against, but I think it is fairly safe to assume that Pilsbry did. There is, as you mention, considerable variation in the emphasis of the shoulder and of nodes on the shoulder of T. fluctuosus, but I doubt if thi this is consistent enough to warrant separation of a subspecies. Pilsbry in the Manual of Conchology shows that Reeve has somewhat confused the tropical West American species, and I have just been verifying this. What Reeve figures as T. fluctuosus seems to be T. magnificus Jonas, from Ecuador. T. fluctuosus he calls T. tessellatus. His figures of T. saxosus are correct. "

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More about Myidae vs. Myacidae etc.

In our Minutes # 67, p. 1, March,1947 the matter of the formation of certain family names was discussed. When covering the families in our work on the distributional list,your editor, John Q. Burch, was disposed to follow Thiele and practically all of the European authors, Powell of New Zealand, the Australians etc. in the use of the simple termination of Myidae,Solemyidae rather than Myacidae and Solemyacidae. This proceedure was questioned and the matter submitted to our recognized scholars Dr. Joshua L. Baily Jr. and Dr. A. Myra Keen. When they agreed that the family names should be Myacidae and Solemyacidae the matter was considered closed with our check list to be so corrected. However, in the parlance of our elections " another precinct has been heard from".

A personal communication July 2,1947 from Mr. R. Winckworth, editor of the Proceedings of the Malacological Society of London follows:

" It is a pleasure and priviledge to receive the Minutes of the Conchological Club of Southern California. I should not agree with the proposal to alter Myidae and Solemyidae to Myacidae and Solemyacidae. There is a confusion here between two Latin words. One is classical Latin word myax (stem myac) used by Pliny and taken from the Greek MYA*. The other is a late Latin word mya used by Linnaeus, who also uses it in the plural as myae (not myaces) on page 1112 of Systema Naturae edition 12. A classical scholar is not always the best guide to zoological Latin, which is often late Latin, as used by scientists of the 18th century."

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Mr. V.D.P. Spicer, Rt. 2, Box 237, Centralia, Wash. " Dear John- ...Am glad I can call you a personal acquaintance after the delightful A.M.U. meeting. We had a pleasant uneventful return just getting home before the fourth. I would like to exchange a single specimen of dead Cypraea ostergaardi for a set of Cypraea stolida. That does not dound like a very attractive offer but there are no live ostergaardi and when my few are distributed there are no more and I wish to distribute them as widely as possible. "

A deal but for fact that the editor has no duplicate C. stolida.

DIRECTORY OF CONCHOLOGISTS by John Q. Burch

The next issue of the Directory which is planned soon should be a very great improvement over the first effort. I am reminded of stories I have heard of merchants placing signs in their windows with misspelled words on them because they discovered that countless persons would come in to inform about the error. However, I sincerely appreciate the notes from a host of my friends calling attention to certain errors in this directory. Of course, the source of the names was one problem.

It was not my intention to place any name on this list that was not wanted there. I have had no complaint on that score from anyone because I purposely left out a host of people that I personally knew to be collectors but who did not register their names with me. There are names in the list from but two sources. 1. They wrote me and gave me their interests, or 2. the name was published in an established printed periodical as such. At first I was a little hesitant about using the second group but after writing any number of my friends both here and abroad decided that there could be no possible objection. Such dependable advisors as J.R. le B. Tomlin wrote me that they could see no reason not to simply use the roster of members as published by the leading Malacological societies of the world. Of course, most of them co-operated with me in every way. The Malacological Society of the Netherlands, of Cuba, etc. sent me lists of their members and in many instances listed the particular interests of the members. This was sincerely appreciated and I thank them.

However, I used the latest list of the membership of both of the British societes, and one of the lists at least was far from up to date. The result was, I am sorry to say, that I listed the names of some 6 or 7 persons who are now deceased. These have been called to my attention and corrected. The names will be listed below in case readers may wish to correct their own copies. In the meantime though a host of new collectors have registered their interests with me until the stack of the card index of them under ' addenda' is almost as large as the original. The next issue should be at least twice the size of the first. I had no idea there were so many interested persons.

Mr. R. Winckworth has advised me as follows: " I am always interested in conchologists as well as in mollusks, and I looked through the Directory of Conchologists with some care. I am very sorry to report that among those who have recently passed away are : Rev. E.P. Blackburn, D. Keogh, C.P. Richards G.C. Robson, J. Simpson and (as I only heard last week) Professor F.A. Singleton. Dr. W.J. Arkell F.R.S. who has done so much on fossil bivalves and ammonites has been home from the Sudan for a long time: his address is Hustcote,Cumnor,Oxford, England. Dr. J.W. Jackson has retired from the Manchester Museum and from the secretaryship of the Conchological Society. His address is 6 Brown Edge Road, Buxton, Derbyshire, England. I notice two mistypes: Professor F.A. Schilder after a bad time during the war as an anti-Nazi has been reinstated and also made professor. His town is Naumburg (Saale) My brothers address (Colonel Winckworth) is given as Seychelles,England. It should be Seychelles Islands."

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Dr. W.P. Woodring, Geological Survey, Washington 25, D.C. We cordially thank you for both the checkand the orchid. " I am enclosing a check for $2.50 as a subscription for your indispensable Minutes of the Conchological Club of Southern California. I wish to again congratulate you on your sustained effort. Kindley change my address as above."

Dorothea Franzen, Dept. of Biology, Washburn Municipal University,Topeka, Kansas. New address- former address as Cedar Crest College, Allentown, Pa.

New Publications Received

Cotton, Bernard C. : Australian Recent and Tertiary Turridae. Field Naturalists Section of the Royal Society of South Australia Conchology Club. Publication No. 4. Adelaide, South Australia. June 30,1947.

34 pages and 4 plates covering many species. The plates are clear and the text is a distributional check list giving type localities of each species. The figures are beautifully clear. We can but wish that we had a similar work covering the species of this coast. The price is two shillings. The editor will be glad to order some for those wishing copies for their personal libraries.

The South Australian Naturalist- Journal of the Field Naturalists Section of the Royal Society of South Australia. Price One shilling per copy.

We have not been receiving this very interesting and well prepared periodical which is obviously our loss. Three copies were sent us with the compliments of Mr. George Pattison, Glenelg, South Australia. In addition to fine articles on other natural history groups there are some very well prepared papers on mollusks as follows:

Cotton, Bernard C. : Some Australian Turridae- April 1,1947 4 pp 1 pl.
Cotton, Bernard C. : Australian Limpets of the Family Lottiidae. June 1,1946 3 pp 1 pl. 18 figs.
Weeding, B.J. : Variations in Chitons from the Flindersian Region. Dec.1942
Pattison, George: Some History of Kangaroo Island, South Australia
Cotton, B.C. and Frank K. Godfrey: The Protoconch or Embryonic Shell of a Gastropod. 5 pp

Hertlein, Leo George and A.M. Strong: Eastern Pacific Expeditions of the New York York Zool. Soc. Mollusks from the West Coast of Mexico and Central America. Part V. Feb. 21,1947.pp 129-150, 1 pl. 16 figs.

This welcome addition to the other work of the authors just received. It covers the superfamilies, Lucinacea,Leptonacea,Cardiacea, and Cyrenacea.

A few notes of interest follow.

Taras subquadratus (Carpenter). We gave the range of this species from Santa Monica Bay southward but were almost unanimous in commenting that we found it difficult or impossible to separate the adults of this species from T. orbellus Gould. The authors here give the range from San Ignacio Lagoon and also give some accurate additional data on the distinctions a brief study of which causes me to be inclined to think that perhaps the reason we found difficulty in separating this species is because we have never had it.

Kellia suborbicularis Montagu is used by the authors here. In our study of this genus we decided that the west coast species could be distinguished from the English suborbicularis on the theory that our shells are not as orbicular nor as high. The result was that we have been using the name Kellia laperousii Deshayes. The authors here use suborbicularis ranging from Alaska to Peru. If the authors of this paper have studied a large series of this group and concluded that they are but one world wide species we should correct our nomenclature accordingly.

Sportellidae- The authors here are using this family name to cover two genera- Basterotia and Sportella. Sportella has been grouped with the Leptonidae by most authors. Whether this is the first usage of this family name I do not know.

Dinocardium robustum Solander- First record for this coast of this Atlantic species.

The Nautilus, Vol. 61, No. 1, July,1947. There are a number of fine papers in this issue as usual, but with little bearing on the fauna of this coast. The question of the validity of *Musculium* as a genus distinct from *Sphaerium* is discussed in the paper " Preliminary Observations on Reproduction in the Molluscan Genus Musculium" by Harley J. Van Cleave, A. Gilbert Wright and C. William Nixoh. This is of interest in connection with our discussion in Minutes #71, p 9 in which Dr. Hans Schlesch took issue with us for so using *Musculium*. Some additional data on *Cypraea cervinetta* Kiener and *Cypraea atabicula* Lamarck is given in a brief paper by William M. Ingram and Harold Trapido. It is interesting to note that they use the generic name *Cypraea* and not *Trona* . The raising of the subgenera of *Cypraea* to generic standing following Schilder and others is still a good subject for an argument. " A New Species of Naticarius From Florida" by Dr. Harald A. Rehder is interesting and the use of the name *Naticarius* with full generic standing is also a matter of note. The exact reasons for this usage would be of interest. " On the Term Albino" is the title of a small discussion by Dr. Charles H. Blake under Notes and News. This is a point well taken because it is the custom now to call almost all specimens showing a lack of typical coloration albinos. Of course, this is not the true meaning of the word and no doubt a more descriptive term should be used for such shells.

Basteria, Tijdschrift Van De Nederlandsche Malacologische Vereeniging. Vol. 11, Nos. 1,2,3, Mqy 16,1947. This is the journal of the Malacological Society of the Netherlands and is a very impressive issue of 87 pages containing a number of plates and figures.

The first paper brings up again the old argument of "genotype vs " generic type" etc. One side of the case was presented by Prof. M.J. Sirks and the other by C.O. van Regteren Altena. We will not go into the matter her since it is always good enough to divide a group for discussion. The two long and well presented papers are by J.G.J. Kuiper and W.S.S. van Banthem Jutting.

Twenty-Ninth Biennial Report of the Division of Fish and Game for the years 1944-1946. 155 pages. There are a good many references and data on mollusks, but of course, of the commercial species- Abalones, Oysters, Pismo Clam etc. One rather interesting note for example is an indication of the comparative abundance of the Pismo 6lam (*Tivela stultorum* Mawe) along the west coast of Lower California. During the war years we canned a great deal from Mexico. In 1944 shipments of shucked Pismo clams were 6,680,000 pounds representing a harvest of over 53,000,000 pounds in live weight. And the figures for some of the catches are amazingly large. The report states that 15,226,000 pounds of squid was landed in the year 1945 alone. I wonder who ate all of that squid. And in case you should feel that there are no game wardens about it might be well to see that among many other items 5,577 arrests and seizures of abalones were made in the year 1945-1946, 5,402 for clams, etc. Interesting figures some of them- Even during the war years deer were killed (legally) 36,940 in 1944, 38,129 in 1945. And mountain lions- plenty of them.

The Journal of Conchology, Vol. 22, No. 10, 2nd June, 1947. Among the many interesting papers in this issue one will be disposed to stop and examine the figure of the new species of Fusitriton (algoensis) described by J.R. le B. Tomlin from South Africa. The species is so very close to our west coast Fusitriton oregonense (Redfield). Mr. Tomlin compares the two though commenting on the differences. Afrivoluta pringlei is also described and figured by Mr. Tomlin. This is of interest because of the description of the new genus as well as species. " Arion ater (L) and A. rufus (L.) in Britain and Their Specific differences " by H.E. Quick is worked out in great detail showing very careful study.

Mollusca Vol. 2, No. 1, June 23,1947. Paul H. Reed, Publisher. Tavares, Florida. $2.50 per year. In this issue Mr. Reed brings out an entirely new format. It is very clear and readable. The only objection I can think of is that it will be impossible to bind Mollusca vols. 1 and 2 in the same backs.

This issue is devoted to a series of articles by D.H. Kennelly, Uitenhage, South Africa and should be of great value to all persons interested in studying this fauna.

La formación holocena en el Departamento de Montevideo by Otto de Mata, Imprenta Nacional, Montevideo, Uruguay, 1947. 57 pages in Spanish. This seems to be a very carefully worked out study of this fossil formation in the Montevideo section. Faunal lists and charts are included.

No price or data on the availability of this paper is with it but the address of the author is: Otto de Mata, 2954 Ramon Masini, Montevideo, Uruguay.

Circulares De La Sociedad Malacologica " Carlos De La Torre" Museo Poey, Universidad de la Habana. Junio 24,1947.

These are numbered mimeographed sheets with news notes on the affairs of malacologists in Cuba. We have a file of them and have read them with great interest. It was our impression that these were to be largely devoted to personalia, but some of them contain information of great interest. For example a number of papers devoted to the possible propagation of the Schistosoma mansoni by certain Cuban species. The circulares are also deserving of a library file.

Puget Sound Oyster Bulletin- Mimeographed reports from the State of Washington, Dept. of Fisheries, State Shellfish Laboratory, Gig Harbor, Wash. Milo Moore, Director and Joe A. Craig Chief Biologist. These reports have been coming out weekly and contain a great deal of valuable information to those interested in oysters.

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The California Academy News Letters gives this about, Dr. G. Dallas Hanna " .. has reported from Alaska, where he has gone for a two months scientific survey of Dall Island," weather fine- no rain- no snow- no wind- no glaciers- no bears- no mosquitoes- no Eskimos- lots of fish- birds scarce- flowers blooming- a few snails- a few slugs- no salamanders yet."

Well- how do you like the new typewriter ? The salesman assured me that this type would be easier reading. Anyway the old was getting to be like the old gray mare and the only bad feature about this is that I have no alibi for doing poor work. I have long been aware also that our mimeographing was something like halitosis. Your friends are just too polite to tell you very bad it really is. So since we seem compelled to abandon the idea of having our papers printed we have purchased a better mimeograph and a better grade of ink and propose to run on but one side of the paper. This should result in much better copy. In addition to this we expect to have an occasional plate printed on which we can figure unfigured types and other data pertaining to each species.

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Jay A. Weber, 1400 N.E. 108th St., Miami 38, Fla. We recently enjoyed an afternoon when Mr. Weber was our guest. He is now on his way north with plans to visit Puget Sound and British Columbia. He should have a nice trip.

D.L. Emery, 121 Twentieth Ave., South, St. Petersburg, Fla. " I arrived home O.K. without any mishaps but on the return trip we came over Walnut Ridge in N.E. Ark., one of the highest points east of the Rockies and it got me a little but the stewardess took such good care of me.. ." We enjoyed having Mr. Emery with us and regret that his stay was so short.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

Minutes of the July meeting of the Conchological Club of Southern California. The club met at the Los Angeles Museum the evening of July 1st and was called to order by Dr. Gregg later than usual due to the difficulty of finding parking space. Our attention was called to the Nautilus index. Mr. Burch told of a communication from the F.B.I. but satisfied our curiosity by stating that Mr. J. Edgar Hoover is a shell collector.

A new 110 ft. boat is to be built for marine investigation by the Hancock Foundation.

Mr. and Mrs. A.C. Bippus of Toledo, Ohio were special guests.

All enjoyed the speaker of the evening, Mr. E.P. Baker. His descriptions were so graphic we felt we shared with them in their collecting at Punta Penasco and Cholla Bay. He displayed a lovely collection of shells and apparently everything was fine but the weather.

Mr. Burch gave an interesting report of the successful meetings of the Malacological Union at Pacific Grove and a shell collecting trip in Monterey Bay. The Conchological Club of Southern California was well represented at Pacific Grove. The hope for more such gatherings was voiced.

Henrietta Gillis- Secretary

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Prof. Eduard Degner, Zoolog. Museum, (24) Hamburg 36, Jungiustr. 6,Germany. " I am very much obliged to you for the sending of your lists on books and conchological material. Now we at least can see what progresses are made in the study of some branches of natural history during the last years.

The Hamburg Zoological Museum, having lost both building and collections (incl. library) during the war, has the task to

rebuild the one and the other and your well renouned firm would be a good source of supply, but alas, under the present conditions there is no possibility either to buy books or shells, or to give equivalents in exchange. Therefore, I unfortunately cannot make use of your friendly offer, although your " Directory of Conchologists" would be quite indispensible for me. By the way I ask you to put my name in the new edition: ...."

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* Note*- In this connection it is interesting that we are still unable to mail such things as books and out Minutes etc. to Germany. All such shipments have been returned to us with some post office sticker on them to the effect that they do not conform to some rule. It is not in my place to try to give any advice but it seems a bit absurd to have to relay our papers to Germany. We send them to Denmark or Sweden from where they can apparently be forwarded without difficulty. It seems odd that while one may apparently ship a box of groceries to Germany he cannot send copies of conchological papers. Perhaps all shells are considered subversive propaganda.

Cuban Mail- How many have tried to mail a box of shells to an exchange correspondent in Cuba ? My sympathy if you have tried. The post office department has a rule that no parcel post package may be accepted to Cuba without what they call a consular invoice. Now this consular invoice can only be had from the local Cuban consul for the sum of 50¢. I recently mailed my 50¢ in cash asking for the proper papers from the consul in Los Angeles. Nothing was heard from it for a couple of weeks or more when I telephoned. After much delay I was finally told that all cash sent there was lost and that I should always send a check. Fair enough- I charged off the 50¢ cash to loss and sent a check for 50¢. Another two weeks or more and still no paper so I finally managed to find it and call in person at the consuls office. The boy and girl in charge were obviously much more interested in each other than they were in my desires and seemed to resent my intrusion. However, I finally induced them to accept my 50¢ (the third 50¢ I was out by the way) and reluctantly gave me the necessary papers- a sheaf of them , I forget how many and each one too big to fit anybody's typewriter unless you have a billing machine. I still have no idea who or what got my first two 50¢ payments. But after a delay of about 6 weeks I finally managed to triumphantly mail my box to Havana.

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Miss Julia Ellen Rogers, 355 Junipero Ave., Long Beach 4, Calif. Author of The Shell Book if you do not already know it- the book unfortunately out of print and in great demand.

" ....I am just home from my first visit to Hawaii. The shell club there is a vigorous group. They have a Mr. Charles A. Allen as president. He reminded me that he gave a talk in my home some time back. He is in some kind of broadcasting work in Honolulu-- but took time to take me to the Bishop Museum and there was a delightful club picnic at Sunset Beach. Mr. D. Thaanum just back from a collecting trip to Guam, was much dissapointed with

results. He gave me some Cypraea from the island. He is a profound student, age 80- who is a proof reader on a local newspaper. Mr. George T. Arneman showed me his amazing collection of tree snails, personally collected, in over twenty years. He has every specimen dated and its location charted. I have never experienced such hospitality as Americans showed me in Honolulu. They are a distinct minority in a mixed oriental population that seems to overwhelm them. And the " burst of spring" in the islands in May and June is a vision of Paradise. ..."

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The Annual Report for the year 1946 of the California Academy of Sciences at hand. An outline of the multitudinous activities of this great institution could not be attempted here but a few items may be noted. For example " The Dept. of Paleontology, in addition to receiving and caring for substantial collections acquired by gift and field work, has catalogued and labeled about 800 type specimens, bringing the total of catalogued specimens of types in the collection to 8,660..."

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Herman W. Miller, Apartado 1320, San Jose, Costa Rica. " Just had a lot of fun collecting with Maxwell Smith. He didn't have much time. He is talking of coming back here next year with a jeep. You had better see him about coming along. ..I enjoyed collecting with him..."

Donald Cordry, Fray Angelico # 30, Mixcoac, D.F., Mexico " ... Sorry we missed the meeting ! ! Maxwell Smith was with us here in Mexico and we had a fine day land-shelling near Cuernavaca. He also identified some shells I dredged in Acapulco."

Otello Ciarla, Rua Augusta,91, Rio de Janeiro, Brazil. " ... For the next edition of your Directory, please note that I am especially interested in the following numbers: 1-2-3-6-9-11-12. My address must be corrected to Rua Augusta 91, omitting the No originally indicating number.

There are practically no collectors here, neither do there exist Malacological Societies or descriptive literature on the coast marine shells, which, by the way, are not even being sold regularly. There certainly exist various specimens of coast shells in this country, but very rarely one or the other can be found for sale. My work keeps me in town constantly, so that I cannot spare the necessary time for collecting personally. On the other hand, the proper places for collecting, are not quite accessible ones, due to missing facilities of transportation. Trying to obtain some new specimens, I also called on several owners of fishing boats but without success, for the time being. It seems that the professional fishermen work at relatively long distances from the coast and that their nets apparently do not reach the bottom of the sea. Under these conditions they very rarely bring any shells on shore. .... my interest is limited to purchases only. .. Unfortunately, in consequence of the recent decision of the Brazilian Government, forbidding the importation of products not considered of essential utility, it is now quite impossible to obtain U.S. dollars for remittances abroad."

J.W. Brookshire, 948 E. Beverly, Bellflower, Calif. Jack was with the army air transport during the war with a flying record that should be mentioned. However, he seems to have had his face-plate, flippers and other diving equipment with him most of the time and returned with a very remarkable collection of fine and rare shells personally collected by diving. The following list is confined to but one of many islands visited with similar lists.

LIST OF SHELLS COLLECTED ON SAIPAN ISLAND

Arca krausii Krauss
A. tenell Reeve
Asaphis deflorata L.
Cardita variegata Brug.
Codakia interrupta Lam.
C. punctata L.
Lima sp.
Navicula ventricosa Lam.
Pedalion sp.
Spondylus sp.
Tellina rugosa Born
T. scobinata L.
Tridacna squamosa Lam.
Astraea petrosum Martyn
Atrina japonica Reeve
A. sp.
Bulla vernicosa Gould
Bursa bufonia Gmelin
Callistocypraea testudinaria L.
Cantharus rubiginosus Reeve
C. undosus Reeve
Cellana tremanerica Nuttal
Cerithium humil ? Dunker
C. nodulosum Brug.
C. nesioticum Pils. & Van.
C. sinense Gmelin
C. variegatum Quoy
Columbella deshayesi Crosse
B. marquesana Gmelin
C. tringa Lam.
Conus arenatus Hwass
C. capitaneus L.
C. cattus Hwass
C. chaldeus Roding
C. coronatus Gmelin
C. distans Brug.
C. ebraeus L.
C. eburneus Hwass
C. flavidus Lam.
C. geographicus L.
C. imperialis L.
C. litteratus L.
C. litteratus bandanus
C. lividus Hwass
C. marmoreus L.
C. miles L.
C. millipunctatus Lam.
C. oblitus Reeve
C. omaria Reeve
C. pulicarius Hwass
C. rattus Brug.
C. striatus L.
C. sumatrensis Hwass
C. taheitensis Hwass
C. tessulatus Born
C. textile L.
C. tulipa L.
C. terebra Born
C. vexillum Gmelin
C. virgo L.
C. vitulinus Hwass
C. sp.
Cylindra crenulata Gmelin
Cymatium tuberosum Lam.
C. sp.
Cypraea annae
C. annulus L.
C. caput-serpentis L.
C. carneola L.
C. erosa L.
C. helvola L.
C. intermedia Gray
C. lynx L.
C. mauritianus L.
C. moneta L.
C. nucleus L.
C. poraria L.
C. punctata Gmelin
C. reticulata Martyn
C. scurra Chem.
C. talpa L.
C. tigris L.
C. ventriculus Lam.
C. vitellus L.
C. sp.
Distorsio anus L.
Drupa morum Roding
D. ricinius L.
Engina phasinola Duclos
Eupleura tampaensis Conrad
Gibbula concinna Dunker
Haliotis sp.

Imbricaria (nr punctata,Swain.
Iopas sertum Lam.
Latirus tessellatus Kobelt
L. sp. 2
Lioconcha castrensis L.
Littorina pintado Wood
Melampus ater Muhlford
Melanella sp. 2
Mitra acuminata Swain.
M. ambigua Swain.
M. chrysalis Reeve
M. chrysostoma Swain.
M. cucumeria Lam.
M. digitalis Dill.
M. episcopalis L.
M. ferruginea Lam.
M. limbifera Lam.
M. litterata Lam.
M. pellis-serpentis Reeve
M. pontificalis Lam.
M. serotina ? A. Adams
M. (scabricola) sphacrulata Martyn
M. virgata Lam.
M. zephyrina Duclos
M. 2 sp.
Modiolus auriculatus Krauss
Morula margariticola Broderip
M. nodus Bory St. Vincent
M. spectrum Reeve
M. tuberculata Blain.
Nassarius rufocincta A. ADAMS
N. sp.
Natica euania Dall
N. marochiensis ? Gmelin
Nerita polita L.
Neritina hellvillensis Crosse
Oliva gustata
O. sandwichiensis
Patella optima Pilsbry
Peristernia 2 sp.
Phalium vibex L.
Pisania ignea Gmelin
Planaxis lineatus Da Costa
Polinices mamilla L.
P. pyriformis Recluz
Pterocera chiragra rugosa Sby.
P. lambis L.
Pyramidella mitralis A. Adams
P. sulenta
P. sp.
Ricinulata digitata
Septifer sp.
Strombus lentiginosus L.
Strombus tridentatus Lam.
S. urceus L.
S. sp.
Tectarius sp. possibly new
Terebra argus Hinds
T. babylonica Lam.
T. chlorata Lam.
T. crenulata Lam.
T. dimidiata L.
T. maculata L.
T. oculata Lam.
T. peasei
T, subulata L.
T. tigrina Gmelin
T. sp.
Thais aperta Blain.
T. armigera Dillwyn
T. intermedia Kiener
T. pica Blainville
T. sp.
Torinia variegata Gmelin
T. sp.
Trivia insecta
Trochus conus hirase Pils.
T. incrassatus Lam.
T. obeliscus Gmelin
Turbo intercostalis
Vasum ceramicum L.
V. turbinellum L.
Vexillum amabilis Reeve
Cypraea isabella L.
Drupa arachnoidea
Tellina perna Spengler

THE BAKERS TAKE A TRIP TO MEXICO

By E.P. Baker

At the November meeting of the club, H. Arden Edwards of the Southwest Museum aroused our interest in his exhibit of shells and his account of a trip to Punta Penasco, in the north of Sonora, Mexico on the Gulf of California about a hundred miles south of the mouth of the Colorado River. That same week a copy of the current Arizona Highways came to hand and there was an illustrated account of the same place telling of the fine new road the Mexican government had built, and of the new territory it opened up as yet native and unexploited. This more than aroused our interest, and we began to make plans for a trip there ourselves. We decided that right after the Christmas holidays there would be time. The last day of the old year '46, I hurried home from work, packed our equipment into the car and after a bite to eat and a goodbye to the girls, we set out, leaving home by 7:30 P.M. Having phoned the Auto Club as to the best route into the Valley, we drove out Santa Ana canyon, via Corona to Riverside as the wind was a gale beyond Ontario. Over the Jackrabbit grade, Beaumont, Banning and down into the valley. The wind was blowing a scarf of snow down from old San Jacinto and Indio was far from hot. We stopped at Westminster for a hot coffee or two and lunch. Bobbie, the dog and El Rojo, the cat, had to get out and stretch and endeavor to ascertain just what it was all about anyway. At Holtville we stopped for gas and oil, then pushed on to Yuma. It seemed to be getting colder and as it was past midnight, the inspector barely poked his head out of the door to ask if we were natives and citizens, and bade us begone to bang the door shut and get back by the fire. Crossing the Tinajas Atlas range, the roads were under repair, necessitating constant care in driving round those hairpin curves, hoping no traffic appeared. We stopped at Welton for coffee, and sped on, thru Mohawk aztec and Sentinel and tho just before dawn, it seemed more than ' darkest', smelled like rain and as I was almost asleep anyway, we pulled to the side of the road, set the alarm clock and slept an hour. The sunrise was marvelous. The Crater range was Black, silhouetted against the blood red of the sun and assumed queer and startling shapes as of dinosaurs and prehistoric beasts unknown. We drove into Gila Bend at 7:30, by our time, and found out that we had forgotten to turn our watch ahead an hour at Yuma, so we broke our fast at 8:30 at the Shell Cafe and gassed up at the Shell station, proper thing for conchologists, eh? But brother, it was cold. An old darky who was firing up a trash barrel on the corner with old papers in order to get a little warmth told me, ' Brother, it sure is cold. Yerterday mornin' we had hoar frost here in Gila Bend. I been here near thirty years and never seen such cold.", and this was supposed to be on the desert.

Breakfast over, we turned south from Gila towards Ajo, a desert country to be sure and thru the Crater range. Here many geological formations and interesting rocks made for many a pause and occasionally a lengthy stop, for Irene's main interest is rocks and minerals, even tho she is a rare shell collector. ' Black Gap' was an interesting pass, thru volcanic black lava heaped up into hilly mounds everywhere. During the war the Air Corps had ranges all thru this country and every side road was posted, KEEP- OUT. So of necessity we kept on the straight and narrow. Passing thru Ajo we

took the wrong turn and found ourselves inside the mining compound. I drove up to a workman and asked him about the road, but instead of answering me he said, " How did you get in here ?" " Right in thru that gate" I said. " Didn't the gate keeper stop you ?". " Didn't see any gate keeper" I replied. Well he said to get out the way I got in and turn to my right and cross the tracks. We thanked him and made a right-about, and were on our way. We still didn't see any gate keeper. Being the 1st I suppose he was celebrating somewhere. About 16 miles along we entered the Saguaro National Forest where the giant cactus in grotesque forms sprawled everywhere, intersperced with organpipe and ocatillo. The official at the immigration station, situated midway of the forest was interested in our tour and suggested Cholla Bay as a detour and possible good hunting grounds. Thanking him, we drove on and soon were at the Mexican border. Checking first with the U.S. border officials we were directed to the Mexican border officials about 100 yards away, crossing an invisible but tangible line in so doing and found ourselves in MEXICO. We told the officer who came out to see that we were Americanos on the way to Punta Penasco to hunt for marine shells. He wasn't interested, rather he pointed to an adobe house where he said the Secretary of Immigration lived and to get our visas there. I found the Sect. in and in spite of my poor Spanish and his poor English, my $20.80 Mexican pesos ($4.40 U.S. currency) secured for us visas for a 6 month stay if we wished to stay that long. I told him we planned to return by Sat. night at the latest and he said if he were not at home to just stick my papers in the mail box outside. Si, senor, mucho gracias and adios. A mile or so onward and we passed thru the little town of Sonoyta via a detour with a ford of the river. Straight south and a little west, 117 kilometers to the gulf, miles of purple desert verbena scarlet ocatillo, golden daisies, white and gold primroses, a veritable kaleidoscopic carpet of natures lovliest. If you haven't seen the winter wildflowers on the desert after a cloudburst of rain you haven't seen one of this earth's most beautiful offerings. We reached Punta Penasco about 1:30 and I asked the way to the Police Hdqts. A woman with a babe on her hip answered my knock, but she ' no savy English'. A bystander who did, pointed out the police up the street, who when I caught up with him was a big man, a two gun man, who had evidently been celebrating the New Year also, but who gave me to understand, with a sweep of his arm, ' that Americanos camp beyond the hotel'. This proved a space approx. 100 yds. wide by 200 yds. long on the edge of the bay which was very 'public' and how. All the fishermen passed to and fro from their boats this way, all the kids congregating around the wharf made this their playground, and the others who had little else to do, just hund a around here on the edge of the bluff. Well, we parked our car so as to shelter our tent from the wind blowing from the gulf and pitched camp. When our gasoline stove caught afire from faulty generation the boys had a great time helping put it out by generaally getting in the way. They were interested in all we had and how we did it and what for. By 2:30 we were ready to poke around under the wharf as the tide was out about 25 or 30 feet leaving the piling naked. I was surprised to find no mollusks on the pilings at all. Not even barnacles. But around the rocks that made up the footings of the approach to the wharf proper were literally

windrows of shells, dead ones of course, but in among the rocks and on them were others (alive) and we began in earnest to scoop them up. We decided that as this was all new to us and our stay a short one, that we would collect as many species as we could find, dead or alive, in order to know what one might expect to find here in the way of collecting. *Turritellas*, both *tigrina* and *goniostoma* were piled on the sand and around the rocks by the hundreds, all dead, some more so than others, by that I mean that some selected ones when cleaned and oiled could hardly be told from those taken alive, though we found none alive. Cones, the *regularis* were found in numbers, and *oliva* and *olivellas* . Many *Neritas*, several *Nassarius*, and some *Eupleuras*. The 22 or 23 rayed starfish, *Heliaster kuninjii* Xantus, was new to me, and here among the rocks and at the base of the pilings were any number of them and 10 or a dozen of them went into my box. The sun began to lower and we trudged back up the hill to camp. Supper over, finding I had failed to bring any formaldehyde with me, we set out to find the local drug store. The ' botica' was pointed out to me up the hill and we finally located it only to find that the proprietor was not in and that his wife could not speak English. I looked over the shelves in the front room but could find nothing that looked or even smelled like it. Irene and the senora were trying to make out with signs, but failing the senora caught Irene by both hands and almost crying said, " Senora, you no spik Espanol at all?" Oh." She finally made us understand that her husband, the pharmacist, would be back in the morning. " Come, manana."

As I said before it was cold, brother, and by now the wind was up and the sun was down and it was colder. We hit the hay, figuratively speaking, and removing only our shoes, we wrapped ourselves in a blanket and cuddled down into our sleeping bags and zipped the covers up. In all our stay, the only warm spot we found was our sleeping bags, and the last two nights we had two comforts over them. One solicitous Mexican tried to explain the unusual by telling us, " Senor, this cold wind, it blows down from that California, sure."

Here in the gulf, some 7-800 miles from the body of the Pacific, there is no surf, it is more like a big lake, the blue of the water coming right up to the and with no white frosted waves rolling in, but the wind churned the bay until the roar and sowing of the wind all night long and water blown upon the shore made as much tumult as if it did. About 10 P.M. there was much noise, shouting, banging and clatter from the wharf as a freight puffed in and out on the wharf to where some fishermen and their boats were unloading several tons of fish which were iced and shipped out immediately to big coast markets. All this I was told in the morning. Irene had heard and ascertained what it was while I slept as one dead.

Next morning, after breakfast, we sorted out our pickins of the day before throwing out the junk and boxing the rest. In preparing for the morning's hunt, I strolled up around the back of the hotel, looking for some sticks from the woodpile to wrap chitons on, should we find any. Here, I stumbled over a sizable carton lying on its side half full of shells and others lying all around. From the aroma, I adjudged to myself, ' Aha, some one has collected these and not knowing how to care for them, has thrown them out when they

got too strong for them, or else, they went off and left them and the landlady has tossed them out. An' any ways, I know how to care for them' so I picked them up and carried them to camp where Irene and I sorted them out, for there were many beach worn shells, as well as others, not-long dead. These we boxed and labelled separat-ly, and its a good thing we did, for- but of that, more later. Taking our collecting boxes , we trudged across the village to the foot of Light House cliff and clambering over the rocks down towards the water, we began working back toward camp. The rocks seemed to be of black lava, and the chitons and limpet-like shells, which were very thin in texture, were extremely hard to pick off these rough rocks without chipping the edges. Both chitons and limpets were alone in their genera, finding only one species of each. 1 e. *vegilatus* and *Scuria* *mesoleuca* M. The limpets were a lovely sea-green within, the chitons scaled like a snake skin. These and a couple of species of *Nerita* were about all we found here. So back to camp for lunch. The afternoon tide seemed about the same, 25-30 ft., and about the same time 2:30 (A native told me it was the same all the time) I left Irene to comb the rocks around under the pier, whilst I started off around the bay searching the sand. I h had'nt gone far until I found I had help in the form of a boy about 10 who said he knew where to find shells. Together we found not a few Cones, olivellas, and olives. Swinging around and starting back I met a woman picking up shells. Her face seemed familiar but I couldn't place her. We talked about shells and she told me that when it came to collecting her father was tops, " Thats him over there" she said and pointed to where two men were walking and looking for shells. We joined them and I recognized him as Prof. A. Sorensen of Pacific Grove. His companion was introduced to me, John Strobbeen of Santa Cruz. Together we walked back to the wharf where Irene was excitedly waving to us. She proudly displayed a nice specimen of a sun-dial shell, *Architectonica*. What delighted her most was that she knew what it was when she found it. Reaching camp we parted, the Sorensen's going on to the hotel, but before they had gone but a few steps they met a friend, a Mexican fisherman who owned a commercial boat, whom they knew at Guaymas. They stopped and chatted and we began getting ready for supper. Suddenly I heard an excited and stringent voice, " Where are they ,, they were right here."" Whats become of them?" Looking up, I found that the landlady of the hotel had joined the group. She it was who was excited. On inquiry, I found she was looking for the box of shells I had found in the morning. I told her I had found them, and where and how. She then said that this fisherman had had a letter from Sorensen saying he was coming down and he had collected these shells for him and left them at the hotel. The landlady, not caring for the aroma, had set the box on the back stoop. Her husband in coming out the back door with his arms full of trash had stumbled over it and had given it a kick out of his way, not noticing what it was. Explanations over, I restored what was left, the best of the pickings to Andy, and that was why I was glad I had packaged them separately.

Irene was tired and I suggested that we eat out and not bother with cooking. We had located a small cafe nearby which seemed in favor with the fishermen, similar to a truckers cafe, and we dropped in. Tacos and coffee, and what tacos, Yum-Yum. Four large Tacos and

two cups of c

two cups of coffee apiece for $1.00 to us. They never tasted better to two tired, dirty and wet shellers. As we snuggled into our bags for the night we planned to break camp the next morning and drive around the bay, to the North, to Chollo Bay, a large mud flat, barely covered by water at high tide- only a couple of feet or so. By ten o'clock next morning we were packed and pulling out. The wind was blowing and seemed getting stronger. ' Twas still cold. We followed a sandy road through the chollas and ocotillos, winding back and forth, a one vehicle road. The sand verbenas were lovely and here near the coast the ocotillos were in brilliant bloom. The chollas were no mean little bush here but nearly tree-like and the desert grew them right down to the bay, hence it's name, no doubt. Eight or nine miles and we drew up and made camp in the shelter of a lava cone. Long before someone had built there for we found a cement floor about 12 x 20 along side of which we pulled our car and pitched camp upon it. Here we had our first serious accident. In pulling out the mattress from the back seat one of the ropes securing it caught on the neck of our water bottle pulling it out on the ground and breaking it. At first we thought to pack up and pull back, but Irene remembered she had about two quarts in another jar, enough for coffee, so we continued to set up camp. We started inland around the shore of the bay looking for oysters which we had been told could be found at the mouth of the ' crick' (Creek). We found that oysters had been had by others but we found none. Around what had been fires were mounds of shells of other oysters and Chiones. Near where we camped I gathered a bag full of whitened oysters to sort out when I reached home (and found only one pair) what the diners did with the other valve I can only guess. About two o'clock I looked up from some rocks where I had been searching for Turbos and saw Andy Sorensen coming across the flats with his much rake and bag. He asked if I had taken any Dosinias and I said, " Not today, yesterday I found some". He handed me one which he said he had found dead seemingly filled with sand but a fair specimen. I thanked him and stuck it into my box. We chatted a bit and then he started back to Penasco as he didn't think much of the bay collecting. Irene and I continued on around the rocks working our way out to seaward. Twas cold and the wind had not abated one bit. Out of the protection of the rocks one got both wind and water and we were wet to our waists. I had found Solenosteria, Turbos, a mussel like shell growing in the sand and attached with a byssus, Volsella,guanensis, Polinices, Naticas, C Cerithiums, Crepidulas, Acanthinas, Conus, and Tegulas, some many, others few. As we worked our way out and around the point I hoped to find a blue-lined limpet, which Andy had said was to be found on the point. I was ahead, jumping from rock to rock, when looking back I saw Irene sitting down. I thought, "she's found something nice' and went on. Soon looking back again, she seemed to be in the same place, only hunched over. Running back, I came up behind her unobserved, to find her lifting her tearful voice to the sky " My feet are frozen, my feet are frozen, my, but it's cold.". I shared her sorrow and cold, apologized and suggested we turn back pronto, and get to camp and some hot coffee. Brother, I thought I'd never get her back to camp for she found more shells and things of interest to call to me and show me. For now I had both boxes and bags and her hands were free. But we made it. It blew most of the

night but along toward morning it calmed and the sun arose with a little more warmth. While Irene got breakfast I stowed away our catch of the afternoon before. The Dosinia Andy had given me, I s started to wash out the sand in it and found to my surprise it contained an Octopus of about 1 ft. spread. It had been cut under one leg and evidently been in the shell some time and seemed to be nearly dead. Having my starfish in a pan of sea water I closed the shell upon him and stuck him in the water to keep until I got home. Right then I began to wonder if Andy was a jokester and if that was a sly play on me for having copped his shells the day before. If so, it went over big, for I have the Octopus pickled up at the museum for identification and he has his shells and his fun, - that is if he knew what his shell contained. Ha Ha. Driving back to Punta Penasco, we were graciously given water for our car at the service station, tho it was not drinking water, water for t the twon seemed to arrive via tank cars on the railway. I think one of the hotels up on the hill had its own well. I purchased a large Strombus at one of the curio stores for 50¢ and after bidding my young Mexican friend who was interested in shells adios, we headed for home. Nothing of interest other than giving back our visas to the Secy. at the border; explaining to the U.S. official that we hadn't had out suit cases open while across, as it was too cold to even take our clothes off, let alone change anything, he took us at our word and let us by without having to unload. We stopped longer at the Immigration station as the guard was interested in what we had taken. From him we learned about the New Year's bowl game, he having heard it over the radio. We stopped for dinner at Ajo, some cards at the post office, and gassed up. Here we found a gob of snow the size of a tub which the attendant said was kicked off the running board of a car just in from Tuscon. Brother, I told you it was C*O*L*D. Lingering again along the road between here and Gila Bend on the lookout for geological specimens, we found some very interesting material, including a very nice chalcedony rose. Darkness was upon us ere we got through the Atlas range, for, while the road crew had done some fast work since we came down, the traffic was heavier and the dust thick amidst many 'ohs' and ' ahs' often we were slowed to a walk. Yumaswas but a pause, the officer flashing a light in over our baggage caught sight of some botanical specimens " Any soil on that"? he asked, pointing with his flash t to them. Upon our answer, ' No Sir(, He said " Turn to the left lane and get out." We did just that. Gas at Holtville and then a steady drive for home. As we headed north up the valley I was reminded of what the Native had said,"These cold, senor, it comes from California", and as we neared the top of the grade it seemed to get colder. I was trying to drive and sit on my hands at the same time. Looking up at old San Jacinto in the moonlight, snow blowing in spume around its head like the hair on an old man, I shivered and said to Irene, " He was right, that native, here we're in California, and brother, its cold."

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Ossian Haggfors, Rudedammsgatan 19, Kalmar, Sweden. " ... I am a collector of shells, and want to increase my collection of foreign marine shells. If desired I offer for exchange Swedish non-marine or fossil shells"

* Note* One of our members handed Mrs. Burch $2.50 for the Minutes at the Pacific Grove meeting. Anyway she forgot who gave it to her. Please advise.

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T. Pain, " Regency House", 71 Gower St., London, W.C. 1, England. " ... I enclose a list of species of the genus Placostylus (Beck 1837) I at the moment possess. I am interested particularly in those from the island of New Caledonia. I shall be very grateful if you can enable me to add to this collection. I am very anxious to obtain specimens of Placostylus corpulentus (Garsier) a sub-fossil shell from New Caledonia. The other genus I work on is Pila (Ampullaria) Lamarck. I have not sent a list of species I already have since I possess over 160 different species, but if you have any very fine or large examples I should be interested.
Genus Placostylus (Beck 1837) P. eddystanser Pfr; bavayi v. dupuyi Kob. etc.
* Note* Any of our correspondents possessing such material are invited to correspond with Mr. Pain.

Students of particular groups are always invited to use this paper for their notices and requests.

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Mrs. Mary W. Cornett, 2229 Griffin Ave., Los Angeles 31. " Enclosed am sending $2.50 for the Minutes. How I did wish I could have gone to Pacific Grove. ..." Mrs. Cornett has been busy with her canary birdery or what is it you call them. In any event she raised or I think the correct term is ' put on the perch' 275 last year and about the same this year. That sounds like a lot of bird songs is they could all sing in unison. Anyway she raises the best and they win bird prizes far and wide. She has been getting some nice shells from a friend in Panama. One of her questions may well be answered here. The present address is of,
Rev. Paul D. Ford, Box 924, Nassau, Bahamas.
C.L. Blakeslee, Mendon Center Road, Pittsford, N.Y. " I am secretary of the Kiwanis Club and when they don't come around to pay their dues after I have sent them a notice I go around thinking what I would like to do to them. When the Minutes came this morning I had just closed a letter to one delinquent and then the thought came to me, - " what am I doing about paying my dues to John Burch?" My head dropped in shame and while in that position I thought it would be a good time to write out a check and so it is enclosed and I am back looking the world in the face again. And furthermore I got my money back before the day was over when I read that excellent article on Tyrian Dyes by Effie Clark. I recommended to to Mrs. Blakeslee and after reading it she agreed with the statements just made. Now when I get time I want to read her other articles. I think a fine, interesting article like any one of the three is of great value to your publication. ... Sorry I could not get to the convention. Would like to have seen you."
Mrs. H.A. Dancer, 3131 E. 1st St., Duluth, Minn. " I have enjoyed more than I can tell you the " Minutes of the Conchological Club of Southern Calif. The articles by Effie M. Clark are really wonderful. She must have written some books that I should like to buy. If she hasn't published a book I should like to know why she is " hiding her light under a bushel". I love the one on Tyrian Dyes and Their Shell Fish Origin". In this essay she makes the

poetic and subtle observation that man's journey round the world after conchs and pearls is a tale through which runs like a thread of gold " the search of questing man for God". Sometimes I have felt on seeing some exquisitely beautiful shell for the first time as though I had caught a glimpse of the " Unseen God."

Mrs. Geo. Bengston, 230 Moir St., Waterloo, Iowa. They were flooded out of their home hence the change of address. Mrs. Bengston asks if we know of any books or papers bearing on the land and freshwater fauna of Iowa. Anyone knowing of such will please write her.

Earl S. Herald, Aquatic Biologist, Philippine Fishery Program, c/o U.S. Embassy, APO 900 c/o Postmaster, San Francisco, Calif. " .... Is the Conchological Club of Southern California still functioning. I used to attend meetings during 1933-34 when I was studying shells under Dr. Howard Hill at the Museum."

Mr. Howard Gilmore, Chesham RFD, New Hampshire. " Ralph Humes was up up to my camp a couple of days ago and he brought a shell I ordered which is exceedingly perfect, and beautiful and I think fairly rare." " Chester Melville is coming up for a few days the middle of August. His collection is at least double the size of mine. He has a wonderful collection of Scala-Liguus- and Papuina and the finest collectioion of Spiny Oysters I have ever seen. ..."

Burry's Marine Museum, Pompano, Florida. " .... Received the Directory of Conchologists. I would like to congratulate you on the splendid job you have done. ... The work you people are doing should set an example for other sections of the country in organizing clubs. " " I can readily understand your problem of cost for the Minutes in having it on letter paper. Would it be possible to run you your notes on a good quality of paper for those that would be willing to pay the extra cash ? Enclose check $2.50 for the Minutes."

More About the A.M.U. Meeting at Pacific Grove

Mr. A. Sorensen, 247 Granite St., Pacific Grove. " I believe you are right when you say that the convention was a real success, and I have received quite a few letters from attending members saying they had a wonderful time. ... Mr. and Mrs. Jay Weber of Miami who are now visiting (an collecting) at Pacific Grove, told me that they heard in San Diego that our meeting was such a success that it was planned to hold the annual meeting every other year in California. You and I know that is a little far fetched, though it would be desirable...."

Mrs. P.H. Teskey, 144 Harlem Ave., Buffalo 10, N.Y. Thank you, Mr. Burch, Mrs. Burch, Mr. Sorensen, Mrs. Welchel, for a most happy time. You heard me sound off on the charms of my beloved Florida, but don't get me wrong: the South has no monopoly on hospitality, for your brand was the best ever. And nothing in Dixie can equal the beauty and fascination of a Pacific tide pool in the early dawn. I shall never forget it. ..I only hope that the abalone shells which I managed to ship home (Thanks, Mr. Strohbeen) will be as much appreciated by my favored friends, as were the Mexican shells by all who received them at the meeting. That was a thoughtful and charming souvenir."

W.J. Bower, 340 3rd St., S., St. Petersburg, Fla. " Dear John- The undoubted success of the 1947 A.M.U. meeting ...I appreciate greatly the box of Calliostoma from the kelp which of course will be divided with my friends Capt. Haas, and Miss Haas."

SHALL WE HAVE A CONCHOLOGICAL ARISTOCRACY?

By John Q. Burch

Aesop's Fables are reputed to tell of a man with two wives, one old and one young. He wished to please both so he let them both comb his hair. The old wife wished him to be old as she was, so she pulled out all the black hairs. The young wife wished him to be young as she was, so she pulled out all the grey hairs. Of course, he became perfectly bald. Moral: he who tries to please all succeeds in pleasing none. I hasten to assure the members though that that is not the reasons for the editors bald head, he having long ago abandoned all hope of pleasing all. Therefore, it is to be expected that there are many who do not care for our little mimeographed paper, but it is both amusing and flattering that one or two seem to have become our avowed enemies. Their uncomplimentary remarks about us need concern us little but the reasons for them are of interest.

There are a few who have the attitude that anything they publish regarding a mollusk should be immediately accepted by all as the ' Tablets of Moses' or an edict from ' On High'. One of these published a paper some time ago and all we did was to courteously point out where he was in error in our opinion. One of the members, not the editor, sent a copy of our paper to him and received the reply that he disdained to answer anything appearing in a mimeographed paper. Several years have passed and nothing further heard in any kind of print. Such an attitude is rather amazing because all of the really outstanding scholars with whom we are acquainted are pleased to hear of any possible error. They are not at all as one classical example of the above mentioned type who, when confronted with a question replied " Why bring that up again ? I settled that 10 years ago." It seems that one who refuses to hear of his errors is one who very likely cheats at solitaire.

Anyway the question of format was again raised by one of these parties. He wishes our paper to be barred from consideration as a publication. Nothing would please him so much as to have an Emperor who would hand down an imperial edict that nothing could be published about a shell unless embossed on gold plate with the next step, of course, another edict giving him exclusive priviledge of embossing gold plate. Shades of our forefathers who signed the Magna Charta forbid.

The question before the house now though is this. Our little paper is a perfect product of ' laissez faire'. It started as one sheet to announce our meetings. We have no endowment and are perhaps one of very few semi-scientific periodicals whose entire existence is financed only by those who care to read it. Of course, it is the property of the Conchological Club of Southern California. However, it seems very clear that the club members do not wish to assume the financial responsibility of launching a printed publication that might very possibly run well into the red ink. But IF enough persons or institutions are interested in sponsoring such a publication by agreeing to pay $3.50 per year the first year, I will start printing as an individual enterprise, a creditable report of about 16 pages, one photographic plate, every other month. Let me have your ideas.

NEW BOOKS

Your order for any of the following new 1947 books will receive prompt and personal attention when sent to John Q. Burch, 4206 Halldale Ave., Los Angeles 37, California.

Dubkin, Leonard: " Enchanted Streets" $3.00
A book about airborne spiders, stinkbugs, weasels. rats, butter--flies, beetles, and birds- all the teeming but little known animal life of the city.

Kieran, John : " Footnotes on nature" $3.00.
A walk with the sage of " Information Please". The lore of the out-of-doors in a delightful book that is also a useful field guide.

Hazard, Joseph T. : " Pacific Crest Trails". $3.00
This book is packed with adventure,humor,mountaineering thrills and never to be forgotten tales of travel to little known places along the Pacific slopes of North and South America. It is the only book available that covers completely this almost unknown network of trails and roads running from Alaska to Cape Horn.

NEW ATLAS

The New Illustrated Library World Atlas $5.00
An amazing book- A geographical encyclopedia- 332 post war pages, excyclopedic in scope, Maps of every country and state. 130 maps and illustrations in full color. Physical and resource maps. Illus--trated world geography, Gobal air age maps, Races of Mankind pic--torially presented. 250 illustrations, 32 of them gleaming full color photographs.
Handsomely bound in embossed rich maroon. Size: 12½ x 9 5/8 ".

Caldwell, J.B. : Introducing Alaska $3.75
Gillham, Chas. E. : Raw North $3.75
Christopher, Lloyd: Pacific Horizons $3.00
Most of us know something of Captain Cook; but what happened before him ? This book is the story of the exploration of the Pacific. It describes the adventurous voyages of men of all nations- Magellan,Quiros,Dampier, and Bouganville.

Murphy, Robert Cushman: Logbook for Grace $4.00
Dr. Murphy is now the distinguished ornithologist and Chairman of the Dept. of Birds in the American Museum of Natural History.

Parker, G.H. : Animal Color Changes $5.00
The remarkable extent of the growth of this subject is indicated by Dr. Parker's bibliography which contains 1200 items. Deals with chromatophores, with color changes in cephalopods, crus--taceans and vertebrates.

Wisconsin Society for Ornithology- " Silent Wings". $1.00
A Memorial to the Passenger Pigeon.

Hausman, Leon Augustus: Illustrated Encyclopedia of American Birds
$2.49

Peterson, Roger Tory: A Field Guide to the Birds $3.50
Revised entirely- 1947 edition
Shelley, Donald A. : Audubon Birds $1.00
From the original water colors in the New York Historical Society. Well worth the small price charged.
Spiller, Burton L. : Grouse Feathers $3.75
First published in a limited edition for $10 per copy.
Bond, James: Field Guide to Birds of the West Indies $3.50
Carter, Mrs. Annie Burnham: " In Am Herb Garden" $2.00
Fairchild, David: The World Grows Round my Door $5.00
Hausman, Ethel Hinckley: Illustrated Encyclopedia of American Wild Flowers $2.49
Hough, Romeyn B. : Handbook of the Trees of the Northern States and Canada. $5.00
Bailey, John Wendell : The Mammals of Virginia $5.00
Cahalane, Victor H. : Mammals of North America $7.50
Ingles, Lloyd Glen: Mammals of California $4.00
Putnam, Brenda: Animal X-Rays $3.50
Reynolds, James : A World of Horses $5.00
Rice and Gleason: Cats, Cats and Cats $3.00
Troughton, Ellis: Furred Animals of Australia $5.00
Wilwerding, Walter J. : Animal Drawing and Painting $6.00
Delacour, Jean: " Birds of Malaysia" $5.00
This interesting work has just been delivered.
Babcock, Havilah: My Health is Better in November $3.00
Ludlum, Stuart D. : Great Shooting Stories. $3.00
O'Connor, Jack: Hunting in the Rockies $5.00
Pope, Saxton Temple: Hunting with the bow and arrow. $3.00
Popowski, Bert: Small Game Hunting $2.49
Pickwell, Gayle: Amphibians and Reptiles of the Pacific States
All of the amphibians and reptiles are illustrated and described.

BETWEEN PACIFIC TIDES by Edward F. Ricketts and Jack Calvin $6.00
A complete 1947 revision of this fine work long out of print.
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COMPARISON OF THE MOLLUSCS OF THREE PLEISTOCENE BEDS WITH THE RECENT FAUNA OF LOS ANGELES COUNTY, CALIFORNIA

By Beatrice L. Burch

INTRODUCTION

The fauna of three Pleistocene beds in Los Angeles county, California were compared with the Recent fauna found in the vicinity. The beds chosen were : 1.-Baldwin Hills- Del Rey,- upper Pleistocene; 2.- Nob Hill, lower San Pedro; 3.- Timms Point, lower San Pedro. The Recent fauna is restricted to San Pedro, around the Palos Verdes rocks and offshore, especially at Redondo and north to the Del Rey slough.

The actual material was gathered by Thomas A. Burch and John Q. Burch from 1936 to 1941. Supplementary geologic data were taken from the papers listed.

PHYSICAL GEOLOGY OF THE FORMATIONS

NOB HILL** The Nob Hill formation is lower San Pedro. The top 17 inches is loosely washed sand and small drift shells (apparently an estuary exposed to severe storms). Beneath this is a conglomerate mass two feet thick. It is very compact, but not hardened and contains many shells washed up from greater depths. Below this layer is a four inch bed of *Ostrea lurida* Carp. and *Aletes squamigerous* Carp. shells lying in natural position. Under this shell layer is 17 inches of sand which in turn covers another plentiful, undisturbed bivalve bed of mainly *Macoma nasuta* Conrad and *Macoma secta* Conrad. The deepest layer is fifteen inches

(con.)

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sparsely filled with shells, mostly bivalves. Thus, it can be seen that three different types of ocean bottom and fauna were present during the time this area was being formed.

TIMMS POINT is part of the sea cliff near Point Firmin northward along the east side of the town of San Pedro, California. The oldest rocks are sandy, brown, fractured siltstone intercalated with a few thin layers of hard weathering limestone. The three main beds are clays and silts. The uppermost is an uncemented clayey fine sand and silt sixteen feet thick, predominately yellowish with local gray streaks and patches. It contains scattered Lucina annulata Reeve and locally lenses six inches thick of greatly leached fossils. The middle bed varies in depth of one to two feet. The color is yellowish to greenish brown and is a fine silty sand containing pebbles of hard shale and limestone. Pelecypods are abundant. The lowest bed of twelve feet thick is yellowish massive clayey silt, streaked with gray. There are present numerous bored pebbles of the underlying shale. The base is almost entirely foraminifera and a few small molluscs. The middle part of the layer contains more gastropods and bryozoa and locally abundant at the southern end.

BALDWIN HILLS fauna were uncovered in Trench 6 of the Los Angeles outfall sewer and in removing earth to make a " fill", for Lincoln Highway. The cut exposed is about eight to twelve inches thick in most places and lies from two to four feet below the present surface. The bed is bordered above and below by sand containing a few scattered , small, water-worn stones.

RECENT physical geology is varied as were the collecting areas ranging from littoral rocks and shallow water sand to deeper water fine sand, muds and a few restricted rocky areas. Most of the recent collecting was dredged from an area six miles square directly off Redondo Beach and including a considerable part of the Redondo submarine canyon. The walls of the canyon are sand, mud and not of lithified rock except in a few small areas.

FAUNA OF THE FORMATIONS

NOB HILL-- Oldroyd (1924) found that the fauna is typical of very cold water such as now found in Puget Sound, especially in the cold San Juan Channel. From the latitude chart of range distribution * see foot-note- it is now evident that the fauna is not predominately a northern one, but quite comparable to the present forms now dredged along this vicinity. Oldroyd notes that all along the coast there is a streak of typical northern forms at 100 fathoms, this streak extending clear down to Lower California. Most of the specimens were now located at 25 fathoms, very few at 100 fathoms. Out of 187 species taken, 22 are now warmer water fauna (ranging from 0o Lat. N. to 34o Lat. N. 18 are typical cold water fauna ranging from 34o N to northern water. 101 species range above and below 34o N. See chart for mid point distribution.

* Foot Note-- Keen's check-list gives ranges and calculated mid-points for all recent species found along the west North American coast. Her mid-points are used.

TIMMS POINT fauna is both warm water and cool water, depending upon which bed is studied. Clark (1931) concluded that a typical cool water fauna over-laid a somewhat warmer water transitional fauna

(con.)

Also that a cooling climate, rather than an increase in depth of water was the determining factor for the cooling water. That some warm water fauna were found also might be explained by cooler water species beginning to appear before the warm water forms were driven out from the unfavorable environment. Arnold (1903) and Oldroyd (1924) concurred with this opinion. Note in each latitude chart there are few species whose mid-point of range lies between 36oN and 39oN. Perhaps further collecting between these latitudes would produce a larger number found there.

The bathymetric table at 25 fathoms shows a dominant cool deep water life, and a lagging littoral to 10 fathoms fauna. This would tend to support Clark's view that the Pleistocene Timms Point area was then also a cooler water habitat.

In the Pleistocene, the Baldwin Hills was apparently then a slough also and tended towards a warm water fauna. Of those species, 70 are warm water fauna, 8 are cold water species and 178 overlap this latitude.

The bathymetric table shows the shallow water habitat of this fauna, though there are a goodly number of cool water deep forms present. Willett (1937) explains this by a mixing of fauna, those cool water species were fragmentary and eroded and were perhaps already fossils when the others were living.

Of the Recent fauna, more were found at 25 fathoms than at other depths. In 50 to 75 fathoms fewer animals were taken, the ocean bottom was perhaps scoured clean by currents, or lack of food and oxygen, and increased turbidity contribute to the sparse fauna. At any rate the lateral distribution is considerable-- species range both north and south of this vicinity with the mid-point of most ranges near 33o-34oN as was found with the fossil beds.

DISCUSSION AND CONCLUSIONS

Many of the fossil species are found at present in the same vicinity. Out of all the species collected, 13 of the species of pelecypods are present in all four regions studied.

	range in degrees N S-N: mid-point	depth in fms. s-sand g- gravel r-rocks m-mud
Nuculana taphria Dall	30-38:34	10s,25g
Glycymeris septentrionalis Mid.	34-55:45	25g
Pecten latiauritus Conrad	23-38:30	25g
Lucina californica Conrad	27-42:34	25g
Kellia laperousii Deshayes	30-60:45	25g
Trachycardium quadragenarium Con.	32-37:34	25g
Saxidomus nuttallii Conrad	30-41:35	10s, 25g
Tellina buttoni Dall	23-58:40	10s, 25g
Macoma nasuta Conrad	28-60:44	10s, 25g
Solen sicarius Gould	30-49:39	25g
Mactra planulata Conrad	23-37:30	25g
Schizothaerus nuttallii Con.	28-38:33	littoral
Saxicava arctica Linne	8-72:40	25g-100r

There are 18 species of gastropods found similarly.

Conus californicus Hinds	26-38:32	10s,25g
Antiplanes perversa Gabb	:34	75m
Olivella biplicata Sowerby	25-49:37	10s,25g
Cypraeolina pyriformis Carp.	23-58:40	25g
Nassarius cooperi Forbes	32-48:40	25g
Nassarius perpinguis Hinds	28-48:38	10s,25g
Epitonium acrostephanum Dall	33-48:43	75m
Epitonium indianorum Carp.	32-55:43	25g
Seila montereyensis Bartsch	32-37:34	25g
Micranellum crebricinctum Carp.	30-55:42	10s,25-50g
Turritella cooperi Carpenter	28-37:32	25-75g
Crepidula excavata Broderip	-5 -37:16	25g
Crepidula nummarius Gould	16-65:36	25g
Polinices altus Arnold	33-37:35	littoral
Polinices lewisii Gould	33-51:42	10s,25g
Acmaea insessa Hinds	25-57:41	littoral
Calliostoma dolarius Holten	33-57:45	25g
Decomphala stearnsii(Bartsch)	:34	25g

These total thirty-one species common to all four areas. It is seen that most of them are found from 10-25 fathoms on sand and gravel ocean floor at the present time off Redondo. Note that this habitat may differ from the earlier fossil deposit enironment. It is of interest too, that the actual number of pelecypods found in all four localities is much greater than those of the gastropods. This may have some significance biologically. Specific pelecypods may have wider adaptability to conditions as shown by less change of specific variation. Larger numbers of gastropod species are found in all four areas with a lower percent of species being carried over from one habitat and time to another. It has been assumed from mollusc phylogenesis that gastropods are more primitive. Their approach to environmental change seems to be to form new characters, creating new or different species rather than assuming a greater tolerance to environmental change.

KEY FOSSILS

The following tabulates the key fossils of the various beds.

area	Pelecypod no. species	gastropod no. species	total species
Nob Hill	2	62	64
Timms Point	14	19	33
Del Rey	14	28	42

The variations from bed to bed of the fauna are distinct. This is best seen when the actual fossils are examined. As a whole the species are well represented in Recent fauna.

SUMMARY

Fauna from three Pleistocene localities in Los Angeles county, California, were studied.

a. Nob Hill -- lower San Pedro
b. Baldwin Hills-- upper Pleistocene
c. Timms Point-- lower San Pedro

These faunas are compared to the fauna found in the approximate same Recent, marine areas in this vicinity.

The type of bottom, present bathymetric and mid point distribution is compared for all four collections giving the following:

a. Nob Hill fauna is approximately the same as the recent off this coastal area.
b. Timms Point fauna shows some mixing of cold water and warm water fauna with the cold water fauna predominating.
c. Baldwin Hills material is more typical of shallow, warm water, though there is a slight mixing with colder water forms.
d. Recent fauna lives predominately at 25 fms. on sand and gravel bottom.
e. This latitude is the mid-point for the majority of the species from all localities examined.
f. Thirty one species are found common to all four deposits a larger percentage of pelecypods were found common to the four beds than gastropods.
g. The various faunas of the Pleistocene beds were distinct, well represented by key fossils.
h. The Recent fauna is largely a mixture of those species found in this vicinity previously.

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FAUNAL LIST

	Pleistocene			Recent
	Nob Hill	Timms Pt.	Bald. Hills	
Pelecypods				
Solemya johnsoni Dall				x
" panamensis Dall				x

(con.)

Acila castrensis Hinds	x	x		x
Nucula exigua Sowerby			x	x
Nuculana acuta Conrad				x
" cellulita Dall	x			x
" hamata Carpenter	x	x		x
" minuta (Fab.) praecursor		x		
" " lomaensis Dall				x
" oxia Dall				x
" taphria Dall	x	x	x	x
Yoldia cooperi Gabb			x	
" scissurata Dall		x		x
Glycymeris septentrionalis Midd.	x	x	x	x
Philobrya setosa Carpenter	x			x
Ostrea lurida Carpenter	x		x	x
" palmula Carpenter			x	x
Pecten jordani Arnold	x	x		
Hinnites giganteus Gale		x	x	x
Pecten caurinus Gould	x	x		
" diegensis Dall		x		x
" stearnsii Dall		x	x	
" hastatus Sowerby	x	x		x
" hericius Gould		x	x	
" pugetensis Oldroyd				x
" latiauritus Conrad	x	x	x	x
" hindsii Carpenter		x		
" latiauritus monotimeris Con				x
" circularis Sowerby			x	
" " aquisulcatus Sby.				x
" randolphi Dall				x
" vogdesi Arnold			x	
" catalinensis Willett				x
" vancouverensis Whiteaves		x		x
Lima dehiscens Conrad			x	x
" subauricularis Montagu				x
Anomia peruviana Orbigny			x	dead
Pododesmus macroschismus Desh,		x	x	x
Mytilus adamsianus Dunker			x	x
" californianus Conrad	x		x	x
Volsella fornicata Carpenter		x		x
" flabellata Gould			x	x
" pallidula Dall			x	
" opifex Say				x
" recta Conrad				x
Septifer bifurcatus (Con.)	x			x
Crenella columbiana Dall		x		x
" decussata Montagu	x	x		
" divaricata Orbigny				x
Modiolus modiolus Linne	x		x	
" capax Conrad	x			x
Botula falcata Gould	x			
Lithophaga plumula (Hanley)			x	x
Periploma discus Stearns			x	x
" planiuscula Sowerby			x	

(con.)

Thracia trapezoides Conrad		x		x
" pedroana Dall	x	x		
" undulata Conrad			x	x
Pandora bilirata Conrad		x		x
" grandis Dall		x		
" filosa Carpenter		x		x
" punctata Conrad			x	x
Crasinella branneri (Arnold)			x	
" varians (Carp.)			x	
Lyonsia californica Conrad	x			x
" gouldii Dall				x
Mytilimeria nuttallii Conrad	x			x
Entodesma inflatum Conrad				x
Verticordia ornata Orbigny	x	x		x
Poromya tenuiconcha Dall				x
Cuspidaria apodema Dall				x
" beringensis Leche				x
" californica Dall		x		x
" pectinata Carpenter		x		x
" planetica Dall				x
Cardita subquadrata Carpenter	x			
" barbarensis Stearns		x		
" ventricosa Gould	x	x		x
" prolongata Carpenter	x	x		
Glans minuscula Grant and Gale		x	x	x
Chama pellucida Sowerby			x	x
Pseudochama exogyra Sowerby				x
" granti Strong		x		x
Thyasira bisecta Conrad		x		
" barbarensis Dall				x
" gouldii Philippi	x	x		
Axinopsis viridis Dall		x		x
Diplodonta orbella Gould	x		x	x
" subquadrata Carpenter				x
Lucina acutilineata Conrad		x		x
" annulata Reeve	x			
" approximata Dall	x		x	x
" excavata Carpenter			x	
" nuttallii Conrad	x		x	x
" tenuisculpta Carpenter	x	x	x	
" californica Conrad	x	x	x	x
Kellia laperousii Deshayes	x	x	x	x
Aligena redondoensis Burch				x
" cerritemsis Arnold				x
Rochefortia aleutica Dall			x	
" reyana Willett			x	
Bornia retifera Dall			x	x
" cooki Willett			x	
Nemocardium centifilosum Carp.	x	x		x
Laevicardium elatum Sowerby			x	
Americardia biangulata Sowerby			x	x
Clinocardium nuttallii (Con.)		x		
Laevicardium substriatum Conrad			x	x

(con.)

Trachycardium quadragenarium Conrad	x	x	x	x
Trachycardium procerum Sowerby			x	
Tivela stultorum Mawe	x		x	x
Transenella tantilla Gould	x		x	x
Antigona fordi Yates			x	x
Chione fluctifraga Sowerby			x	x
" succinta Valenciennes			x	x
" undatella Sowerby				x
Saxidomus nuttallii Conrad	x	x	x	x
Pitar newcombianus (Gabb)			x	x
Protothaca staminea Conrad	x		x	x
" tennerima Carpenter			x	x
Compsomyax subdiaphana Carpenter		x	x	x
Amiantis callosa (Conrad)			x	
Psephidia ovalis Dall		x		x
" lordi Baird		x		
" brunnea Dall				x
" cymata Dall		x		
Petricola tellimyalis Carpenter			x	x
" carditoides Conrad	x		x	x
" californiensis Pils. & L	x		x	x
Cooperella subdiaphana Carp.			x	x
Tellina idae Dall			x	x
" buttoni Dall	x	x	x	x
" salmonea Carpenter	x			x
" bodegensis Hinds	x		x	
" carpenteri Dall	x	x		x
" santarosae Dall			x	x
" moesta Carpenter				x
Apolymetis biangulata Carpenter	x		x	x
Macoma carlottensis Whiteaves		x		x
" calcarea Whiteaves		x		
" indentata Carpenter	x		x	x
" " tenuirostris Dall				x
" inquinata Deshayes	x	x		
" nasuta Conrad	x	x	x	x
" planiuscula Grant and Gale		x		x
" secta Conrad			x	x
" yoldiformis Carp.			x	x
Semele incongrua Carpenter	x	x		x
" pulchra Sowerby		x	x	
" rubropicta Dall	x	x		x
" decisa (Conrad)			x	
Cumingia lamellosa Sowerby	x			x
Donax gouldii Dall			x	x
" californica Conrad	x		x	
Gari californicus Conrad	x			x
" edentula Gabb			x	x
Sanguinolaria nuttallii Conrad	x			
Tagelus californianus Conrad			x	x
" subteres Conrad			x	x
Solen sicarius Gould	x	x	x	x
" rosaceus Carpenter				x

(con.)

Ensis californicus Dall			x	x
Siliqua lucida Conrad			x	x
Mya truncata Linne		x		
Mactra californica Conrad			x	x
" catilliformis Conrad			x	
" dolabriformis Conrad				x
" pallida modesta (Dall)			x	
" falcata Gould				x
" hemphilli Dall			x	x
" planulata Conrad	x	x	x	x
Schizothaerus nuttallii Conrad	x	x	x	x
Cryptomya californica Conrad	x		x	x
Corbula luteola Carpenter			x	x
Pholadidea ovoidea Gould		x		
" penita Gould	x		x	x
Zirfaea pilsbryi Lowe			x	
Saxicava arctica Linne	x	x	x	x
Panope generosa Gould		x	x	x
Saxicavella pacifica Dall				x
Xylophaga californica Bartsch				x
Barnea pacifica Stearns				x
GASTROPODS				
Cavolina telemus tricuspida			x	
" trispinosa Lesueur			x	
Acteon punctocoelatus Carpenter	x		x	x
" traski Stearns		x	x	
Microglyphis breviculus Dall				x
Retusa harpa Dall	x	x		x
Acteocina culcitella Gould		x	x	x
" cerealis Gould	x			
" culcitella intermedia W.		x		x
" " eximia Baird	x	x		
" carinata Carpenter			x	x
" infrequens C.B. Adams	x			
" inculta Gould		x	x	x
" pedroana Oldroyd	x			
" planata Carpenter				x
" tumida T.S. Oldroyd	x			
Volvulella californica Dall				x
" cooperi Dall	x			x
" cylindrica Carpenter	x			x
Atys casta Carpenter			x	
Diaphana californica Dall				x
Cylichna alba Brown	x			
" attonsa Carpenter		x	x	x
" diegensis Dall			x	
Vesica punctulata A. ADAMS			x	
Haminoea dalli Bartsch	x			
" vesicula Gould	x			x
Siphonaria branneri Stearns				x
Melampus olivaceus Carpenter			x	x
Williamia peltoides Carpenter			x	x
" vernalis Dall				x

(con.)

Terebra pedroana Dall	x		x	x
" " philippiana Dall				x
Conus californicus Hinds	x	x	x	x
" " fossilis T.S, Oldroyd	x			
Borsonia bartschi Arnold	x	x		x
Megasurcula carpenteriana Gabb			x	x
" tryonianus Gabb				x
" remondii Gabb			x	x
Clavus empyrosia Dall			x	x
" halocydne Dall			x	x
" hemphilli (Stearns)			x	
" " aeolia Dall				x
" montereyensis (Stearns)			x	
Ophiodermella grippi Dall				x
" incisa Carpenter		x		
" ophioderma Dall	x		x	x
" fancherae (Dall)			x	x
Pseudomelatoma merriami Arnold		x		
" moesta Carpenter		x		x
" torosa Carpenter		x		
Burchia semiinflata Grant and Gale			x	
" redondoensis Burch				x
Antiplanes perversa Gabb	x	x	x	x
" barbarensis (Dall)		x	x	
" rotula Dall		x		x
" hooveri Arnold		x		
" santarosana Dall		x		x
" renaudi Arnold		x		
" thalea Dall				x
Bellaspira grippi Dall				x
Lora fidicula Gould		x	x	
" kyskana Dall				x
" reticulata Brown		x		
" tabulata Carpenter		x		
" viridula Fab.		x		
Mangelia arteaga Dall and Bartsoh	x			
" " roperi Dall		x	x	x
" angulata Carpenter	x			
" gracilior Hemphill		x		x
" hooveri Gabb		x		
" hexagona Gabb		x	x	x
" merita (Hinds)			x	
" variegata Carpenter		x	x	x
" cetolaca Dall			x	
" crassapera Grant and Gale				x
" oldroydi Arnold		x		
" aspera Carpenter				x
Clathromangilia rhyssa Dall	x			
Clathurella cymodoce Dall				x
" branneri Arnold	x			
" conradiana Gabb		x		
" crystallina Gabb		x		
Daphnella fuscoligata Dall	x			
Philbertia crystallina Gabb				x

Glyphostoma conradiana Gabb	x			
Philbertia canfieldi Dall	x			
Taranis strongi Arnold				x
Admete couthouyi (Jay)		x		
" gracilior Carpenter		x		
" rhyssa Dall	x			x
Alabina californica Dall & Bartsch		x		
Cancellaria cooperi Gabb			x	x
" bullata Sowerby			x	
" crawfordiana Dall			x	x
Cypraeolina margaritula Carpenter	x			
Olivella baetica Carpenter		x	x	x
" biplicata Sowerby	x	x	x	x
" pedroana Conrad	x	x	x	
Hyalina subtrigona Carpenter	x	x		x
" jewettii Carpenter		x		
" pyriformis Carpenter	x	x	x	x
Mitra catalinae Dall	x	x	x	x
" fultoni E.A. Smith			x	
" idae Melville		x	x	x
" montereyensis Berry		x	x	x
Mangelia filosa Carpenter	x			x
Fusinus arnoldi Cossmann	x			x
" barbarensis Trask		x	x	x
" kobelti (Dall)		x	x	
" luteopictus Dall			x	x
" monksae (Dall)	x		x	
Kellettia kelletii Forbes			x	x
Cantharus fortis (Carpenter)			x	
Drupa lugubris C.B. Adams 7				x
Neptunea tabulata Baird		x	x	x
Exilioidea rectirostris (Carp.)			x	x
Engina strongi Pils. & Lowe			x	x
Nassarius cerritensis (Arnold)			x	
" cooperi Forbes	x	x	x	x
" californicus (Conrad)	x		x	
" mendicus Gould	x		x	x
" fossatus (Gould)	x		x	x
" insculptus Carpenter			x	x
" cooperi indisputabilis Oldx	x			
" perpinguis Hinds	x	x	x	x
" tegula (Reeve)			x	
" woodwardi Forbes	x			
Anachis penicillata Carpenter	x			x
Nitidella gouldii Carpenter	x			
Mitrella carinata Hinds		x	x	x
" gausapata Gould			x	x
" gouldi Carpenter		x		
" tuberosa Carpenter		x	x	x
" californiana Gaskoin	x			x
Amphissa bicolor Dall				x
" reticulata Dall		x	x	x
" undata Carpenter			x	x
"				

Amphissa versicolor Dall	x		x	x
" " incisa Dall				x
Aesopus chrysalloides Carpenter				x
" idae	x			
" sanctus Dall				x
Murex festibus Hinds			x	x
" carpenteri (Dall)			x	x
" petri Dall			x	x
" leeana (Dall)			x	
" rhyssa Dall				x
" gemma (Sowerby)			x	x
" santarosana Dall			x	x
Ocenebra barbarensis Gabb		x		x
" circumtexta Stearns				x
" epiphanea Dall				x
" foveolata Hinds		x	x	x
" keepi Arnold	x			
# gracillima Stearns				x
" interfossa Carpenter	x		x	x
" " clathrata(Stearns)Dall				x
" " beta Carpenter	x			x
" lurida Midd.	x	x		x
" painei Dall		x		x
" poulsoni Nuttall			x	x
Thais emarginata (Deshayes)			x	x
" biserialis (Blainville)			x	
Acanthina spirata (Blainville)			x	x
Trophon albospinosus Willett				x
" avalonensis Dall		x		
" bentleyi Dall				x
" eucymata Dall		x		
" tenuisculpta Carpenter				x
" multicostatus Esch.	x	x		
" orpheus Gould		x	x	x
" " pedroana Arnold		x		
" " praecursor Arnold		x		
" triangulatus Carpenter		x	x	x
" pacificus Dall		x		
" stuarti E.A. Smith	x	x		
" raymondi Moody		x		
Forreria belcheri Hinds			x	x
" catalinensis Oldroyd				x
Coralliophila oldroydi Oldroyd				x
Epitonium acrostephanum Dall	x	x	x	x
" bellastriatum Dall		x	x	x
" californicum Dall				x
" cosmanoi Dall & Bartsch	x			
" catalinae Dall		x		x
" crebricostatum Carpenter	x			
" catalinensis Dall				x
" clarki I.S. Oldroyd			x	
" cooperi Strong			x	x
" denisclathratum Dall				x

(con.)

Epitonium evictum De Boury				x
" indianorum Carpenter	x	x	x	x
" rectilaminatum Dall				x
" retiporosum Carpenter			x	x
" sawinae Dall		x	x	x
" spongiosum Carpenter				x
" subornatum Carpenter	x			
" tabulatum Dall		x		x
" tinctum Carpenter	x		x	x
" wroblewski (Morch)	x		x	
Melanella catalinensis Bartsch				x
" fossilis Bartsch	x			
" micans Carpenter			x	x
" oldroydi Bartsch			x	x
" prefalcata Bartsch	x	x		
" rutila Carpenter				x
" thersites Carpenter	x			x
Strombiformis californicus Bartsch				x
" raymondii (Rivers)			x	
Turbonilla adusta Dall & Bartsch			x	x
" acra D & B		x		
" almo D & B			x	x
" pecora Oldroyd	x			
" antestriata D & B			x	x
" aepynota D & B	x			
" aragoni D & B				x
" arnoldi D & B		x	x	
" aresta D & B	x	x		x
" asser D & B	x	x	x	x
" attrita D & B				x
" buttoni D & B			x	x
" burchi Gordon				x
" callisellae Oldroyd	x			
" canfieldi D & B			x	x
" castanea Keep				x
"castanella Dall				x
" chocolata Carpenter	x			x
" epiphanea Oldroyd	x			
" gouldi D & B				x
" hemerta Oldroyd	x			
" halia D & B			x	x
" idae Oldroyd	x			
" hypolispa D & B			x	x
" ista Bartsch				x
" jewetti D & B				x
" keepi D & B			x	
" laminata Carpenter	x		x	x
" lordi E.A. Smith		x		
" morchi D & B				x
" pedroana D & B		x	x	x
" pentalopha D & B			x	x
" rinella D & B	x			
" profundicola D & B				x
" ralphi D & B		x		

(con.)

Turbonilla regina D & B		x	x	x
" sanctorum D & B			x	
" signae D & B				x
" simpsoni D & B			x	x
" stylina Carpenter		x	x	x
" superba D & B			x	
" tenuicula Gould	x			x
" torquata Gould		x	x	x
" tridentata Carpenter		x		x
" valdezi D & B				x
" vexativa D & B			x	x
" weldi D.& B			x	x
Odostomia amiantis D & B				x
" amava Oldroyd	x			
" angularis D & B				x
" californica D & B				x
" canfieldi Dall				x
" cevitella Oldroyd	x			
" dinella Bartsch & Dall				x
" donilla Dall & Bartsch			x	x
" eugena D & B			x	x
" farallonensis D & B		x		x
" fidella Oldroyd	x			
" fetella D & B				x
" gomphina Oldroyd	x			
" helena Bartsch		x	x	x
" helga D & B		x	x	x
" helga D & B				x
" io D & B				x
" ithea Oldroyd	x			
" lastra D & B				x
" manca Oldroyd	x			
" nemo D & B		x	x	x
" mendoza Oldroyd	x			
" nota D & B		x		x
" phanea D & B	x		x	x
" sanesia Oldroyd	x			
" phanella D & B				x
" skidegatensis Bartsch		x		
" subturrita D & B				x
" scelera Oldroyd	x			
" talma D & B				x
" talpa D & B		x		
" tenuisculpta Carpenter				x
" tersa Oldroyd	x			
" trachis D & B				x
" trochila Oldroyd	x			
" valdezi D & B		x		x
" timessa Oldroyd	x			
" virginalis D. & B	x			x
Neosimnia barbarensis Dall				x
" catalinensis (Berry)			x	
Cypraea spadicea Swainson			x	x

(con.)

Trivia californiana (Gray)		x		x
" ritteri Raymond		x		x
" solandri (Gray in Sowerby)			x	x
Erato vitellina Hinds			x	x
" columbella Menke			x	x
Bursa californica Hinds			x	x
Fusitriton oregonense (Redfield)	x	x	x	
Triphora pedroana Bartsch		x	x	x
" fossilis Willett		x		
Cerithiopsis alcima Bartsch				x
" antefilosa Bartsch		x	x	x
" antemunda Bartsch			x	x
" carpenteri Bartsch				x
" fatua Bartsch	x	x		
cosmia Bartsch			x	x
" necropolitana Bartsch	x	x		
" oxys Bartsch			x	x
" fossilis Bartsch	x			
" diegensis Bartsch	x			x
" halia Bartsch			x	
Metaxia diadema Bartsch	x			x
Seila montereyensis Bartsch	x	x	x	x
Alabina tenuisculpta diegensis			x	
" californica Dall & Bartsch	x	x		
Bittium asperum Gabb	x			x
" attenuatum Carpenter	x	x		
" catalinense Bartsch	x	x		x
" giganteum Bartsch		x		
" interfossa Carpenter		x		x
" larum Bartsch				x
" ornatissimum Bartsch	x	x	x	
" purpureum Carpenter				x
" rugatum Carpenter	x	x	x	
" subplanatum Bartsch				x
" serra Bartsch		x		
Cerithidea californica Haldeman			x	x
Caecum californicum Dall	x			x
" licalum Bartsch				x
Spiroglyphus lituellus (Morch)			x	
Micranellum crebricinctum Carp.	x	x	x	x
Bivonia compacta Carp.				x
Turritella cooperi Carpenter	x	x	x	x
" jewettii Carpenter		x	x	
Tachyrhynchus pratomus Dall				x
Lacuna dolida Loven	x			
" unifasciata Carpenter	x		x	x
" porecta Carpenter		x		
Iselica fenestrata Carpenter	x		x	x
Alvania acutilirata Carpenter		x		x
" aequisculpta Keep	x			
" californica Bartsch				x
" compacta Carpenter				x
" montereyensis Bartsch	x			

Alvania pedroana Bartsch				x
" rosana Bartsch				x
Rissoina coronadoensis Bartsch		x		x
" dalli Bartsch	x			
" kelseyi Dall & Bartsch	x		x	x
" pleistocena Bartsch			x	
Capulus californicus Dall				x
Hipponix antiquatus cranoides Cpr.	x		x	
" " Linne	x			x
" tumens Carpenter	x		x	x
Crepidula excavata Broderip	x	x	x	x
" adunca Sowerby	x	x		
" norrissiarum Williamson				x
" aculeata Gmelin	x			x
" nummarius Gould	x			
" dorsata Broderip	x			
" glottidiarum Dall			x	x
" onyx Sowerby	x		x	x
" princeps Conrad		x		
" lingulata Gould		x	x	x
Crucibulum spinosum (Sowerby)			x	
Calyptraea fastigiata Carpenter			x	x
" contorta Carpenter			x	x
Verticumbo charybdis Berry		x		x
Natica russa Gould		x		
" salimba Dall				x
" clausa Broderip & Sowerby		x		
Polinices acosmitus Dall				x
" altus Arnold	x	x	x	x
" draconis Dall				x
" lewisii Gould	x	x	x	x
" pallidus Brod. & Sby.				x
" recluziana Deshayes		x	x	x
Sinum scopulosum Cobrad			x	x
" californicum I.S. Oldroyd	x			x
Exiloidea rectirostris Carpenter		x		x
Acmaea scutum patina Esch.	x			
" limatula Carpenter	x			x
" mitra Esch.		x		x
" asmi Middendorff	x			
" cassis Esch.			x	
" depicta Hunds	x			
" paleacea Gould	x			x
" cassis nacelloides Dall			x	x
" rosacea Carpenter				x
" incessa Hinds	x	x	x	x
" scabra Gould	x	x		x
Tricolia pulloidea Carpenter		x	x	x
" " elatior Carp.	x			
" substriata (Carpenter)		x	x	x
" subturrita Carpenter				x
"compta Gould	x	x		x

Astraea inequale Martyn		x		x
" " pacifica Dall	x			
" undosa Wood		x	x	x
Homalopoma carpenteri Pilsbry				x
" paucicostata Dall				x
Liotia fenestrata Carpenter				x
" acuticostata Carpenter				x
Norrisia norrisii Sowerby			x	x
Calliostoma annulatum Martyn		x		x
" canaliculatum Martyn	x	x	x	x
" costatum Martyn		x		
" gemmulatum Carpenter			x	x
" gloriosum Dall			x	x
" supragranosum Carpenter			x	x
" splendens Carpenter			x	x
" tricolor Gabb		x	x	
" turbinum Dall				x
Halistylus subpoideus Tryon	x			x
" pupoideus (Carpenter)			x	
Margarites parcipictus Carpenter				x
" optabilis (Carpenter)	x	x	x	x
" lirulata Carpenter	x			
" pupillus Gould		x		x
" parcipicta pedroana Arnold	x			
" magna Oldroyd	x			
Solariella peramabilis Carpenter		x		x
Cidarina cidaris A. Adams		x		x
Turcica caffea Gabb		x	x	x
Vitrinella berryi Bartsch				x
" eshnauri Bartsch	x		x	
" stearnsii Bartsch	x	x	x	x
" williamsoni Dall			x	
" thomasii Bartsch	x			
Delphinoidea coronadoensis Arnold			x	x
Teinostoma invallata Carpenter	x			x
Haliotis assimilis Dall				x
" cracherodii Leach			x	x
Fissurella volcano Reeve	x		x	x
Diadora murina Carp.	x			x
" aspera Eschscholtz	x	x		x
Puncturella cooperi Carpenter		x		x
" cucullata Gould	x	x		x
" delosi Arnold		x		
" galeata Gould		x		x
Vermicularia eburna (Reeve)			x	
Aletes squamigerous Carpenter	x		x	x
" " pennatus Morch	x			
Fartulum orcutti (Dall)			x	x
" hemphilli Bartsch	x			
" occidentale Bartsch			x	
Littorina scutulata Gould	x			x
" planaxis Philippi	x			x

Leptothyra bacula Carpenter	x	x		x
" carpenteri Pilsbry	x	x	x	x
" paucicostata Dall	x			
Barleeia oldroydi Bartsch		x		
Diala marmorea Carpenter	x	x		
" acuta Carpenter	x			
Tegula gallina (Forbes)			x	x
" " multifilosa Stearns			x	x
" aureotincta (Forbes)			x	x
" ligulata (Menke)	x		x	x
" pulligo (Martyn)		x	x	
" funebralis A. Adams	x	x		x
" montereyi Kiener	x	x		
Truncatella californica Pfeiffer	x	x		x
Mitrella tuberosa Carpenter	x			x
" californiana Gaskoin	x			x
" carinata Hinds	x			x
Paludestrina curta Arnold	x			
" stokesi Arnold	x			
Syncera translucens Carpenter	x			x
Lottia gigantea Gray	x			x
Megatebennus bimaculatus Dall	x			x

* Note* There are three charts connected with this paper w which will shortly appear in a future issue.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

The regular meeting of the club was held August 5th at the Los Angeles Museum with vice-president E.P. Chace in the chair.

The following visitors were introduced: Maxwell Smith of Florida and Richard W. Foster of the Museum of Comparative Zoology of Harvard University.

Mr. Maxwell Smith spoke of incidents in collecting at Panama and other points reached on his journey to California. Mr. Foster spoke of his impressions of California collecting.

Mr. R.R. Talmade of Eureka, California was present and a number of old members were welcomed including Mr. and Mrs. Galbreath Mrs. J.C. Marsh, Mrs. Mary Cornett.

There were 32 members and guests in attendance.

The lesson of the evening was on the genus Acmaea and was very ably given by Mrs. Elsie Chace.

At the close of Mrs. Chace's paper the meeting was adjourned.

Morris E. Caruthers- Secretary Pro Tem

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Some New Publications Received

The Genera Zeidora, Nesta, Emarginula, Rimula and Puncturella in the Western Atlantic by Isabel Perez Farfante- Johnsonia, Vol.2, No. 24, July 7, 1947.

The thoroughness of this work may be indicated by the 54 pages and 24 plates included. Our only regret is that the author did not include the eastern Pacific as well.

Catalogue des Types et des exemplaires de Cones, figurés ou décrits par Hwass, Bruguiere, Lamarck, de Lessert, Kiener et Chenu, se trouvant au Musée de Genève. Avec 4 figures dans le texte. Revue Suisse De Zoologie by G. Mermod Tome 54 No.5, January,1947

This interesting and valuable work will have many references from students of the genus Conus.

Die gehausetragenden Schnecken und Muscheln des Moorgebietes am Fuße des Untersberges- by Von Friedrich Mahler- Aus.,Mittellungen der Gesellschaft fur Salzburger Landeskunde, Band 1946.

A carefully prepared work in 31 pages is a very interesting contribution from Austria.

California Fish and Game- Vol. 33, No.3, July,1947. A paper of some interest is included in this issue. It is " Pismo Clam Increase" by J.A. Aplin. The facts seem to be that the Pismo (Tivela stultorum Mawe) has made an amazing increase in numbers. Many of us who have searched in vain for our expected repast of fried Pismo have been disposed to fear that this choice morsel was about to become one of those things along with the Dodo. But if the reasons suggested by the author are true then no doubt it will shortly become as scarse as it was before. The author thinks that there were large sets during the war years because of two things- the army barred the public from many beaches especially at night, and in addition the gasoline shortage and other things prevented the usual hosts from enjoying their summer vacations on the beaches and feasting on clams.

Circulares De La Sociedad Malacologica " Carlos De La Torre" Museo Poey, Universidad de la Habana. July 1947.

These mimeographed circulars continue to contain a great many items of scientific interest as well as the personalia.

Puget Sound Oyster Bulletin- State Shellfish Laboratory, Gig Harbor, Washington. We have at hand the past 4 issues of this weekly report. Of course, these papers are of particular interest to those concerned with commercial growing of oysters but many interesting items appear in them. For instance this observation " Extensive spawning of oysters was observed--- about noon of August 7. At the same time the Manila clams or Baby clams, *Paphia phillipinarum* were observed spawning in the same area. It may be that the spawning of one species stimulates the spawning of the other etc. " And in the Aug. 15 issue No.9 they discuss a new variety of Japanese seed oysters " Kumamoto oysters.. said by Japanese biologists to be a variety of *Ostrea gigas* which does not grow as large and has a very desirable flavor".. (con.)

The issue of Aug. 23,1947 No. 10 contains a very interesting article on " Japanese Method of Artificial Propagation of Oysters". The thoroughness of the Japanese methods is rather amazing and in obviously competent hands. At the Anagawa Marine Laboratory of the Tohoku Imperial University in Sendai, Japan, Dr. Takeo Imae artificially propagates oysters. Dr. Inae began his studies in the Japanese universities, but took his Doctor of Philosophy degree at Johns Hopkins University. ...." The bulletins are prepared by John B. Glud and Cedric E. Lindsay who recently made a visit to Japan to study first hand the oyster situation. Their observations on other marine life forms in Japan would be of real interest also.

An interesting little article appeared in Science, July 4,1947 by Hobart M. Smith, Dept. of Zoology, Univ. of Illinois, Urbana, Ill. " Perhaps no words are more often used incorrectly by systematists and their colleagues than availability and validity" The concluding paragraph is a summary " It is obvious that, at any one time, there can be only one valid name for a species, although there may be several available names and even more occupied names. Likewise it is apparent that while all available names are occupied, not all occupied names are available."

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News Items About Collectors

Schuitema, A.K., 37 Uitwierderweg, Delfzijl, Holland. Interested in exchanging marine and freshwater shells of Holland.

A.M. Strong, 320 Anade St., Balboa, Calif. " ..., I am still alive and kicking, tho not very actively. I feel first rate but have largely lost the use of my left side and my walking around is rather limited. I have gotten up town a few times but it is not any pleasure trip. I think the paralysis is working off slowly but it will be some little time yet before I can move around freely. In the meantime I am around the house here or down on the beach. I will be at home to any one who happens to be down this way."

Dr. L.G. Hertlein, Calif. Acad. of Sciences, Golden Gate Park, San Francisco " Dr. Hanna says to tell you that the northern abalone is a beautiful shell, ought to be very valuable to collectors even tho it isn't. He said to quote Reeve that " this beautifully painted shell has more the appearance of a tropical than a northern species, for it presents the brightest display of colors of any of the genus."

G. Mandahl Barth, Danmarks Akvarium, Charlottenlund, Denmark. The editor can vouch for the fact that Mr. Mandahl Barth sends beautifully prepared material. His specimens are first class and accompanied by all data. He wishes to exchange Scandanavian species and if you have first class duplicates please write him.

Mr. R. Winkworth, 71 Whitworth Road, London SE25, England. " It is quite possible I may be sailing for the Seychelles Id at the end of the month." It is hoped that he has been able to make the trip because he would certainly enjoy it. His brother Colonel Winkworth is now in Seychelles.

Walter Klemm, Strasswalchen 93,Salzburg,Austria. Has fine molluscan material of the East-Alps.

P. Kaas, Goudenregenplein 8, The Hague, Holland. Mr. Kaas has sent an interesting list of species of his duplicates for exchange. " I would ask you if there is any possibility for me to obtain North American shells (marine as well as land and fresh-water species) in exchange for Dutch species."

Walter F. Webb, 2515 Second Ave., No., St. Petersburg 6,Fla. This is a new address and Mr. Webb claims that he is now through with moving forever. He has his shell stock now available and is again getting out his interesting shell bulletins. It is doubtful if any man in this generation ever saw as many fine s shells pass through his hands as has Mr. Webb. We wish him nothing but the best in his new location.

Dr. Elmer G. Berry, National Institute of Health, Bethesda, Md. " ... My trip through northern California was most enjoyable and also profitable. I had never had the pleasure of seeing that section of California and was thrilled with the scenery. I collected a good series of Pomatiopsis chacei from Crescent City and from Wilson Creek. Of course we never seem to have enough snails for our experimental work with Schistosomiasis and if any members of your Conch. Club are fortunate in getting any species of Pomatiopsis and would like to donate them to oor laboratory we would be more than pleased to receive them. I usually send them in mailing tubes with the lid perforated so that they wont suffocate, pack the snails loosely in moist dead leaves or grass, and send them via Air-express or air mail special delivery. We will be glad to furnish your readers with mailing tubes and, of course, we will be pleased to reimburse anyone for postage. If sent Air-express collect we can pay the charges at this end.

I am very happy that the meetings were held in California this year and that I had the pleasure of being there and meeting with the western group. I wish that we could plan the meetings sothat we could be on the west coast at least every four years. .."

Professor Trevor Kincaid, University of Washington, Seattle, Wash. " ... In regard to the Paphia or more properly Protothaca I am inclined just offhand to disagree with Dr. Keen as to the identity of the introduced species unless philippinarum is a synonym of semidecussata (Reeve). If staminea and philippinarum are not in the same genus then some conchologist has split some very fine taxonomic hairs. However, I shall be glad to hear the results of the discussion and will abide by the decision of the specialists. ....I am having a very interesting and agreeable season with the oystermen. After several years of failure a fine season has opened up. The oysters in the bay had two periods of active spawning, the second of which is now in progress. On my say-so the pystermen put out thousands of tons of oyster shell to capture the small swimming larvae and induce them to settle down and form spat. I have been in somewhat of a twitter for the past few weeks for fear something might slip in my prognostications, but fortunately everything has gone off in good order so I am now breathing more easily."

Snaink, G., Transvaalstr 80 I,Amsterdam 0, Holland. This Dutch boy wishes to exchange with some of our young members.

We are so frequently asked about the status of the Manual of Conchology, about the prices, availability etc. It is for sale only by The Academy of Natural Sciences of Philadelphia, Nineteen and the Parkway, Philadelphia 3, Pa. The following data was sent us in a letter by Marjorie A. Hambleton, Assistant Editor.

PRICE LIST FOR THE MANUAL OF CONCHOLOGY

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Vol. I	316 pages and 112 plates photostated	$149.80
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Another attached list gives prices on an assortment of parts of various volumes separately priced.

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Walter J. Eyerdam- is again spending the summer in Alaska and has just written- Aug. 8th,1947 " ...Kuiu island is one of the outliers of the Alexander archipeligo. Like all of the rest of these islands it has rather abrupt shores and is covered with a dense growth of Sitka spruce and western hemlock. Nearly all of the islands are mountainous and very sparsly inhabited along the coasts. Here at this place are many black bears. Their trails are everywhere leading down to the water. As many as 22 bears have been seen in one spot. They come down to eat the dead fish and garbage. Most of the bears are quite shy but cannot be trusted too much. We have a two year old that has become quite tame. He often comes into our cabin and begs for food. Several of the old bears are rather grumpy and it was necessary to kill two of them so far. Last summer one of them knocked the lady cook off the dock and she was in a hospital for over two months. Two weeks ago one of them broke the kitchen window in attempting to break in. One of the men shot him and I promptly cut off his head with a butcher knife and prepared his skull. These black bears are an island race of the mainland black bear. The big Kodiak bear that I procured the head from two years ago was

about five or six times as big as a full grown black bear. One of the men also got a big timber wolf. I collected his skull also. Around this camp there are no beaches but when there is a minus tide there are quite a lot of rock shells to be found although I have found only a few rather rare species. The chief attraction in the line of shells around here are the pretty c colored varieties of Thais lamellosa, emarginata and canaliculata of which I am taking a large number. Between times as usual I am collecting all of the species of plants that I can find.

Michael O'Loughling, 63 Columbia Terrace, Terrace, Weehawkken, New Jerseysey, We are happy to welcome an old friend to our shell collecting circle.

Captain C.M. Dumbauld, U.S. Naval Hospital, Dublin, Georgia. Note the new station.

Miss Edna N. Wilson, Sandford Hotel, 1323 5th St., San Diego, Cal. " Wheree I expect to stay until October when I will have a new address in MissionnBeach, Calif.

Charles B. Wurtz, 5055 Copley Road, Philadelphia 44, Pa. " ......" the Academy of Natural Sciences here in Philadelphia has recently uncovered some old stock which includes most of Conrad's plates for his monographs on the Unionidae. None of the text has been found. But of even more interest is their find of parts of Say's " American Conchology". Even the rare seventh part. I don't think they have parts 1 or 2, and I think they lack some plates from all parts. But there's the information anyway. (They want $7.50 a part for Say. I don't know what they want for Conrads plates.)

John Strohbeen, 315 King St., Santa Cruz, Calif. We are pleased to learn that the magnificent collection of Gorgonians and Other deep water forms have been donated to the Stanford University by Mr. and Mrs. Strohbeen., This included the fine table on display at the recent meeting of the A.M.U. at Pacific Grove.

A.W.B. Powell, Auckland Institute and Museum, Auckland, New Zealand, Dr. Powell advises that the set of the Nautilus in the library of the institu ebis incomplete with the following situation: Nautilus in duplicate (for exchange) 7;2, 12:1, 18;10,11,12- 19;1,2,3,4,5,6,7,8- 22;7- 27;5,6,8,10,11,12; 28;1,2,4,5,6- 29; 1,2,5,6,12-30; 1,3,5-31;2- 32;2- 33;1- Numbers required- Vols. 1 and 2, vol 3- nos. 9,10,12- 17;5,12; 20;3-22;2,4,5,6,-23;1,2,3,6,7,8,9,10,11,12-24;2,5,6,7,9,12- 25;1,9,10,11,12-26;2,3,7,8,10,11,12.

C.C. Church, 79 Neww Montgomery Streeet, San Francisco 20, Calif. " .... We are just as sorry as you are aboutn not having you join us at lunch. but perhapd uou will be calling on shell business sometime. You should have been with us today. Allyn Smith was just back from Echo Lake and Doctor Hanna got back from Alaaska just a week ago. He worked out of Ketichikan and tookma boat to visit severaal of of the islands-particullu DallyIsland He did not fine fine thr nesting site of the matbled murlerlet but he got lots of shells by dredging and low tide collecting, The little abalbe ,Haliotis kamtscyatkand is a beautiful shell and he b oughtb back a good many,"

A FIELD GUIDE TO THE SHELLS

New 1947 book $3.50

The Peterson-edited Field Guide series published by the Houghton Mifflin Co. are well known. The new 1947 Field Guide to the Birds $3.50 is without a doubt the most popular bird book in print.

The publishers state that this book covers all the shells that can be found on our eastern seaboard. This statement is, of course, one that should be taken with the well known ' grain of salt'. However, it may do it at that. The prospectus states among other items- 102 shells shown in full color- 400 illus-trated. We have not seen it. It is to be delivered in September.

Your orders will receive prompt and personal attention when sent to John Q. Burch, 4206 Halldale, Los Angeles 37.

Between Pacific Tides by Edward F. Ricketts and Jack Calvin. $6.00. A complete 1947 revision of this fine work long out of print.

West Coast Shells By Josiah Keep. Revised by Joshua L. Baily Jr. $3.75
This is not a revision but a reprinting of the well known work now long out of print. We now have it in stock.

Ancient Plants AND THE WORLD THEY LIVED IN
By Henry N. Andrews Jr.

This new book has just been published by the Comstock Co. 1947 $4.50. A readable, popular account of the plant life of the past. While the science of fossil botany may seem far from the immediate interests of the student of mollusks it is certain that this work should be read for both information and entertain-ment by all of our members interested in fossils

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Igneous Minerals and Rocks By Ernest E. Wahlstrom 1947 $5.50
A new book by the Wiley Co.

Collections Bought The reluctance of a few persons occasionally to offer material they have for sale to an established dealer is amusing to the dealer. We are just unpacking the fifth large collection to be bought so far this year and one of them tried selling to his friends and other collectors. Now he is a bit unhappy after see-ing that our buying prices are several times the amounts he received for those he sold personally.

Our policy is to attempt to serve the collectors to the best of our ability by paying the highest possible cash prices and at the same time to be fair with the buyers by selling at a reas-onable profit.

MINUTES 74 OCT-NOV 1947

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Los Angeles 37, Calif.
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More about ? *Tapes philippinarum* ?

Dr. A. Myra Keen advises " I have heard from Dr. Kuroda in the matter of that introduced clam long known as *Tapes philippinarum*. He says that even fishermen recognize the existence of two forms there, one large and one small, and he suspects the small one is the true *T. philippinarum* and the large the one that has been introduced into our waters. He will investigate the distribution in Japan more closely and will compare the smaller one with Philippine specimens to make sure of this. If the comparison holds as I think it will, then the large one will have to be assigned a new name, and he concedes that *Tapes semidecussata* (Reeve) may be the appropriate name, although he warns that many of Reeve's descriptions and locations are in error. However, he does not concede that this is a *Protothaca*, on account of the lack of internal crenulations of the ventral margin of the shell. He may have something there, as that is supposed to be a diagnostic character of *Protothaca*. But if it is *Tapes*, then Dr. Kincaid will need to do some close observational work to find out if the hybrids which are being produced are fertile.

Western Localities of Shells Illustrated in F.C. Baker's " The Molluscan Family Planorbidae",1945.

Compiled by Robert J. Drake, Dept. of Anthropology,
University of New Mexico

Abreviations

C- Carinifex D-Drepanotrema H- Helisoma M- Menetus
P- Parapholyx T- Tropicorbis

Ariz.: Santa Cruz River:
H. tenue sinuosum (Bonnet) (Plates & figures 98:9-13; 99:4-8
Calif.: No location given:
H. traskii (Lea) 95:22
Colorado Desert:
T. gracilentus (Gould) 130:1-3
Noyo:
M. centervillensis (Tryon) 121:1-5
Canoe Creek:
C. newberryi (Lea) 78:23-4; 113:1-11; 114:16.
Pitt River:
C. newberryi malleata Pils. 113:24-30
Sacramento River:
P. effusa (Lea) 78:20-2; 116: 1-3.
San Joaquin River:
H. ammon (Gld.) 94:25-6
Kern Co.: Bakersfield:
H. traskii (Lea) 95:17-9
Kings Co.: Kettleman Hills Pliocene:
Planorbifex vanvlecki (Arnold) 81:6
Lake Co.: Clear Lake:
C. newberryi minor Cooper. 78:25-6; 114:19-24
H. ammon (Gld.) 89:27; 95:6-11
Lassen Co.: Eagle Lake:
C. occidentalis Hanna 112:12-21; 114:17
P. mailliardi Hanna 116:27-30; 117: 27-30
Los Angeles Co.: Bixby:
H. tenue californiense F.C. Baker 98:26; 99:11-5
Los Angeles Co.: Cerritos:
H. ammon(Gld.) 94:15
Los Angeles Co.: Terminal Island:
M. labiatus F.C. Baker 121:9-11
Monterey Co.: Monterey:
H. ammon (Gld.) 94-17
Riverside Co.: Point Happy, Indio:
H. ammon (Gld.) 95+16
San Benito Co.: Hollister:
H. ammon (Gld.) 94:20±1
San Bernardino Co.: Bear Lake:
M. centervillensis (Tryon) 121:6-8
San Bernardino Co.: Daggett:
H. ammon (Gld.) 89:25
Santa Cruz Co.: Watsonville:
H. ammon (Gld.) 95:12-4

Santa Cruz Co.: Santa Cruz:
H. tenue californiense F.C. Baker 98:16-8
San Diego Co.: San Diego:
H. ammon (Gld.) 94:27
San Francisco Co.:
H. ammon (Gld.) 95:1-5
M. opercularis (Gld.) 79:22-4; 120:1-10
San Joaquin Co.: Stockton:
H. ammon (Gld.) 94:22-4,28
San Mateo Co.: Colma:
M. cooperi crassilabris F.C. Baker 122:13; 123:26
San Mateo Co.: Spring Valley:
H. ammon (Gld.) 89:26; 94:14
Santa Clara Co.: Crystal Lake, San Jose:
H. tenue californiense F.C. Baker 98:19-21
Santa Clara Co.: Los Gatos:
H. tenue californiense F.C. Baker 98:22
Siskiyou Co.: Tule Lake:
H. occidentale (Cooper) 89:24; 93:4
Sonoma Co.: Petaluma:
M. cooperi F.C. Baker 122:7
Tulare Co.: Buena Vista Canal:
H. traskii (Lea) 95:23-5
Tulare Co.: Kern Lake:
H. ammon (Gld.) 95:15
H. traskii (Lea) 95:20-1
Tulare Co.: Owens Lake :
C. newberryi (Lea) 112:9-11
Colorado: Boulder Co.: Gresham Lake:
Promenetus exacuous (Say) var ? 122:26-8
Eldora Co.:
M. coloradoensis F.C. Baker 122:23-5
Mineral Co.: St. Mary Lake:
H. subcrenatum plexatum (Ing.) 92:17-22
Saguache Co.: Saguache:
H. subcrenatum plexatum (Ing.) 89:22; 92:23
Idaho: No location given:
H. subcrenatum (Carpenter) 91:9-12
Blue Creek: Couer d'Alene Mountains:
H. anceps (Menke) 82:16-7
Sand Point, Pend Orielle River:
H. anceps idahoense F.C. Baker 84:26-8
Ada Co.: Boise:
H. subcrenatum disjectum (Cooper) 89:21; 90:16-8
Bonnar Co.: Priests Lake:
H. anceps (Menke) 82:30
Montana: Devon:
H. subcrenatum (Cpr.) 92:11-2
Lindbergh or Elbow Lake, Mission Mountains:
H. anceps idahoensisF.C. Baker 101:11-2
Cascade Co.: Great Falls:
H. subcrenatum plexatum (Ing.) 93:1-3
New Mexico: Bernalillo Co.: Albuquerque:
H. tenue sinuosum (Bonnet) 98:15

Nevada: No locality given:
   H. oregonense (Tryon) 96:4,5
Lake Bigler:
   P. solida optima (Pils.) 120:32
White Pine:
   P. solida (Dall) 116:18-26
Mineral Co.: Truckee Lake beds, Hawthorne:
   Perrinilla cordilleriana (Hannibal) 79:31-2
Mineral Co.: Walker Lake:
   C. newberryi (Lea) 113:12-15
Washoe Co.: Gerlach:
   H. oregonense (Tryon) 96:6-8
Washoe Co.: Pyramid Lake:
   P. nevadensis J. Henderson 117:7-26
Washoe Co.: fossils west of Pyramid Lake:
   P. pusilla F.C. Baker 117:1-6
Oregon: No locality given:
   H. binneyi (Tryon) 94:18
   H. subcrenatum (Cpr.) 101:14
Columbia River:
   H. binneyi (Tryon) 94:19
Pueblo Valley:
   H. oregonense (Tryon) 96:1-3
Warner Lake vicinity Pliocene:
   Paraplanorbis condoni (Hanna) 81:5
Crater Lake National Park:
   P. effusa diagonalis J. Henderson 116:15-7
Clakamas Co.: Oregon City:
   P. effusa (Lea) 116:4-6
Clatsop Co.: Astoria:
   H. binneyi (Tryon) 94:9-11,16
Klamath Co.: Klamath Falls:
   H. occidentale (Cooper) 89:23; 93:6
   P. effusa dalli F.C. Baker 115:27-30
   K. klamathensis F.C. Baker 115:21-3
   P. klamathensis sinitsini F.C. Baker 123:2-10
Klamath Co.: Klamath Lake:
   C. ponsonbyi E.A. Smith 114:1-13,18
   H. occidentale (Cooper) 93:7-15
   H. occidentale depressum F.C. Baker 93: 16-8
   P. klamathensis F.C. Baker 115:15-20
Marion Co.: Salem:
   M. cooperi multilineatus (Vanatta) 120:29-31; 122:9-12
Wasco Co.: Dalles of Columbia River:
   P. effusa costata (Hemphill) 115:24-6; 116: 12-4
   P. effusa neritoides (Hemphill) 116:7-11
Washington Co.: Portland:
   H. anceps (Menke) 82:18-9,26
   H. binneyi (Tryon) 93:19-20; 94:12-3
   M. cooperi crassilabris F.C. Baker 121:21
   M. portlandensis F.C. Baker 121:12-8
Texas: Leon:
   H. trivolvis intertextum (Sowb.) 89:8

Cameron Co.: Brownsville:
T. obstructus donbilli (Tristram) 129:23-5
D cultratum labrosum Pils. 128:6-10
Comal Co.: New Braunfels:
T. havanensis (Pfeiffer) 130:27-8
El Paso Co.: Rio Grande, El Paso
H. tenue sinuosum (Bonnet) 98:25: 99:9,10
Hays Co.: San Mareos:
T. gracilentus (Gld.) 130:4-12
Victoria Co.: Guadalupe River:
T. obstructus donbilli (Tristram) 129:17-22
Utah: Box Elder Co.: Locomotive Spring, Kelton:
H. subrenatum (Cpr.) 91:15
Cache Co/: Newton:
H. subcrenatum (Cpr.) 92:1,2
Rich Co.: Lakota Resort, Bear Lake:
C. newberryi (Lea) 113:16-23
Tooele Co.:
H. oregonense (Tryon) 96:9-12
Utah Co.: Utah Lake:
H. subcrenatum (Cpr.) var.? 91:16-19; 101: 13
Wash.: Freeport:
M. cooperi callioglyptus (Vanatta) 120:19-21
Olga:
M. cooperi F.C. Baker 120:15-8
Pass Lake, Fidalgo Island:
M. cooperi multilineatus (Vanatta) 120:23-6
Whidby's Island, Puget Sound:
M. cooperi F.C. Baker 120:11-4
Orcas Island,Puget Sound:
M. cooperi planospirus F.C. Baker 122:3-6
Douglas Co.: Blue Lake, Grand Coulee:
M. cooperi F.C. Baker 122:1-2
King Co.: Seattle:
H. binneyi randolphi F.C. Baker 94:1-8
M. cooperi crassilabris F.C. Baker 121:19-20
Whatcom Co.: Lake Whatcom:
H. binneyi (Tryon) 93:21-2
Whatcom Co.: Bellingham:
M. cooperi F.C. Baker 120-27
Wyoming: Teton Co.: Jackson's Lake:
C. jacksonensis J. Henderson 115:8-13
Yellowstone National Park:
H. subcrenatum perdisjectum F.C. Baker 96:13-7

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Additional Discussion on Sphaeriidae

by Rev. H.B. Herrington, Newburgh, Ont.,Canada

In the description Family Sphaeriidae Dall,1895 (Minutes of the Conchological Club of Southern California, #69, p.4) we read,(a) " no hinge plate." I don't know what Dall meant by this for Prime had used the term ' hinge plate' in describing Sph. occidentale (see p.9 of these Minutes) and P. compressum (p.14). Sterki also uses the term (p.14). (b) " cardinal teeth usually two in each valve." Haldeman in dealing with Sph.

dentatum (p.7) says " cardinal teeth simgle." " Other students of this family have found one cardinal in the R.V. and two in the L.V. Here is the way Sterki explains the error of " two in each valve" (Nautilus Vol. XXXV, #4, April,1922, p.105) " It has been stated by earlier writers, e.g. Baudon, Prime, Clessin, Westerlund, that in the right valve of *Pisidium amnicum* Muller and *dubium* Say there are two cardinals, and a group, or subgenus, has been established principally on the strength of that feature. But it was a misconception, due to careless examination; in adolescent and mature mussels, C3 is more or less deeply emarginate in the middle, and the anterior and posterior parts were taken for two teeth. ... This mistaken view has been applied indiscriminately to all species of *Pisidium* by some authors, e.g. T. Prime, and even to all *Sphaeriidae* (Prime, '65, pp 2, 33,36 etc.), and it was copied,evidently without examining a specimen, by some American writers...."

One more thing might be said. In the description of *P.compressum* (p.13) Prime says of the beaks " with a wing-shaped appendage on the summits." And Baker (p. 14) says, " with well marked appendages." It should be pointed out that in some forms of *compressum* (as in the case in some other species that have ridges on the beaks) this appendage, or ridge, is depauperate or even absent.

****

Oyster Culture in Japan

Cedric Lindsay and John Glud of the State Shellfish Laboratory, Gig Harbor, Washington made a trip to Japan this year to study the problems connected with the imporation of the seed oysters from Japan. The following letter from Mr. Lindsay is of particular interest.

" At last I am able to sit down and write an answer to your request for information on our trip to Japan. This summer has been a very busy one for us here because we have been trying to carry on extra studies in our controlled tide pool experiment, which was reported in our bulletin, Extensive field work is not conducive to the keeping up with our paper work here in the Lab.

First of all let me give you a bit of background on our trip. Professor Kincaid was originally scheduled to make it, since he is practically recognized as the " Father of the Pacific Oyster," here in our part of the country. However, after consideration of the trip from all angles he decided it would be too tough for him to make. So the Pacific Coast Oysters Growers Association made a request to the State Fisheries Department for the loan of our services and agreed to pay expenses of the trip while the state continued our salaries. We were to represent the state in making sure the oysters were free from pests which could cause serious damage to those oyster beds in the state which up to now are still free from any of the Japanese oyster drills. In addition we were to represent the association in the inspection of the seed itself to make sure it met the contract specifications. In order to enter Japan at all we had to be representatives of the Federal government, so after the customary miles and miles of red tape we were duly authorized Consultants for the U.S. Commercial Company, and as it later

turned out acted as field men for that agency (a part of R.F.C.) in supervising the actual scheduling and loading of the ships at the Port of Oginohama, near Sendai.

I am including along with this letter, a copy of the report we submitted to the U.S. Commercial Co., and the natural resources section of SCAP in Tokyo. It was later published by NRS in Preliminary Report #10. These copies were made up for the oyster growers use and will, I hope, give a concise report on the results of our trip. As our bulletins reach you there is usually a short description of some of the phases of Japanese aqua-culture that we observed. In addition I am also including a copy of a list of edible marine molluscs of Japan. We aquired this at NRS in Tokyo and I cannot vouch for its accuracy. However, it may be of some value to you. And finally here are two of our reports which may not have reached you before and yet may be of general interest to you. The one entitled " The Oyster Fishery" was written by Dr. Vance Tarter last winter after we had received repeated requests from various people to " tell them all about the oyster business". It is very elementary but again may be of interest to someone not familiar with oystering practices. The other report is " General Bulletin #1" of January 29,1947. It is a sort of recap of all the drill information that we have put out to oystermen from time to time. It is surprising to us that there are so many people who have no idea what the drills look like. altho they may have been finding drills in the oyster beds for many years.

To get back to the trip itself; John Glud and I spent most of our time at the seed packing areas and the shipping port. Sendai was our headquarters where we stayed with the Miyagi Military Gov't. Team when not living in the Jap. villages or on the ships. In all there were 8,000 people in 10 villages located in the Matsushima and Ishinomaki Bay areas working on the seed oyster problem. When visiting these villages we were always treated with the greatest of courtesy. At no time was there ever any indication of hostility toward Americans. We were able to try out almost every form of Japanese food. Since both John and I are fish eaters we made out very well. The villages located by the sea always have an abundance of sea foods, at least for those who can pay for the quantity and variety that is available. Each village carries on one or more forms of aqua-culture. In places where the tide flats are extensive, clams are cultivated in plots of ground in much the same manner as potatoes. That is, they are plowed and raked to induce better growth conditions and later harvested and taken to market. A good deal of harvesting of the clams below low tide is also carried on. The vlams most commonly cultured are: *Venus*, *Paphia*, *Anadara* and *Mactra*. In other areas w where beaches are steep, oysters are hung from rafts by means of wires thru the original culture shells. Growth is nearly twice as fast as in the conventional tide flat oyster bed, and in addition the oysters can occupy a growing area from 6" to 20 ft. in depth. One man in Miye Prefecture near Nagoya has a raft form in which he grows two crops of oysters a year from each raft. He catches his own seed in the summer (the oyster is supposed to be a variety of *Ostrea gigas*) that is hung on rafts and allowed

to grow to what we would classify as cocktail or small half-shell size, and then marketed. Immediately the raft is rehung with seed from Miyagi Prefecture - the place where we worked, and that seed is harvested at the same size as the native Miyo seed just prior to the time that the new set is ready to hang. Harvesting of Miyo oysters is done from January to March while Miyagi seed is harvested between July and September. Other types of aqua-culture include seaweed culture, eel culture, spiny lobster forms, and also trout forms, and of course, pearl culture.

Besides our February to April work in Miyagi Prefecture we also made a trip to Southern Honshu and to Kyushuto to inspect some of the oyster growing areas down there where the waters are much warmer than in Miyagi. We also spent a part of a day at the Mikimoto Pearl Farms but did not see the diving since the water was too cold for operations at that time (April).

About the only remarks concerning conditions in Japan that I'd feel qualified to make are that in direct contrast to other war ravaged countries I've read about, the Japs at least are working to get themselves out of the mess they are in. As reagrds personal honesty I would sooner leave my valuables (even food) lying about in the Jap villages than in any town or city in America. Even today after the Japs have been exposed to American influence, stealing (except in the cities) is almost unknown. Practically every necessity in Japan is readily procurable only at Black Market prices, and we were told that price inflation in some items is about 400 times pre-war prices.

The Americans are better liked than their former war leaders, mainly because the common people have much better conditions than under their former leaders. I do not know how the business people feel about Americans.

I hope these few observations will answer some of your questions. We saw so many things that it is hard to tell about them without going into considerable detail. However, I'll be glad to attempt to answer any specific questions you have. "

****

In relation to the above paper we may mention a few of the rather outstandingly interesting bulletins sent us by the State Shellfish Laboratory at Gig Harbor.

General Bulletin , No.1, January 28,1947 . Oyster Drills. This paper is excellent discussing the drills, the various species including the harmless native drill, the Japanese regulations etc. And the phtograph that accompanied our copy shows the adult drill and also the egg case of the Japanese drill, the native drill, and the Eastern drill. And the photographer is to be congratulated for making an unusually clear figure showing every feature.

The bulletin mentioned in the paper " The Oyster Fishery" is also excellent dealing with all phases such as Control of Oyster pests, Artificial spawning and setting of the oyster, Fattening of the oysters, Notes on the biology of the oyster etc.

The bulletin on " Japanese Oyster Seed Export Program for 1947" discusses the handling of the seed oysters , hardening, storing shipping etc.

Of course, all persons interested in oyster culture will wish these bulletins.

Edible Marine Mollusca (Shell-bearing), Brachiopoda and Echinoidea, Japan (Honshu), (Kyushu,Shikoku,Hokkaido)

The bulletin before us shows the distribution in degrees of latitude. However, we will here merely list the species. Those interested in greater detail may ask for a copy of the paper. The report was prepared by K. Hatai, Institute of Geology, Tohoku Imperial University, Sendai, Japan.

* Species distributed to markets, others used only locally.

Venerupis (Amygdala) variegata (Sowerby)
Venus (Anomalodicus) squanosa Linné
* Babylonia japonica (Dunker)
* Haliotis (Sulculus) japonica Reeve
* Haliotis (Euhaliotis) gigantea Reeve
* Haliotis (Euhaliotis) discus Reeve
* Haliotis kamtschatkana Jonas
Monodonta labio Linne'
Tonna luteostoma Kuster
* Turbo (Batillus) cornutus Solander
* Volutharpa perryi Jay
* Rapana thomasiana Crosse
* Neptunea arthritica Bernardi
* Atrina japonica Reeve
Lingula unguis(Linne')
Tripneustes gratilla (Linne')
Pseudobaletia indiana (Michelin)
Acanthocidaris crassispina (A. Agassiz)
* Strongylocentrotus intermedius (A. Agassiz)
* Strongylocentrotus nudus (A. Agassiz)
* Strongylocentrotus pulcherrimus (A. Agassiz)
Strongylocentrotus echinoides A. Agassiz and Clark
Pseudocentrotus depressus A. Agassiz)

Edible Marine Shells of Japan (Not given in attached list)

Sanguinolaria (Nuttallia) olivacea (Jay)- Miyazaki,Hiroshima, Akita,Aomori,Miyagi, Hokkaido
Solecurtus divaricatus (Lischke)- Miyazaki,Fukui,Akita,Miyagi Hokkaido
Laternula kamakurana (Pilsbry)- Fukui,Akita,Aomori,Miyagi,Fukushima,Hokkaido
Donax (Chion) semigranosus Dunker- Miyazaki, Hiroshima,Akita
Chamaeformis lusoria (Gmelin)- Akita
Venerupis (Paratapes) undulatus (Born)- Miyazaki,Hiroshima
Pinna attenuata Reeve- Miyazaki,Hiroshima,Fukui,Hyogo
Chamaeformis petechialis lamarckii (Deshayes)-Miyazaki,Fukui
Gafrarium dispar (Dillwyn)- Amami-Oshima,Miyazaki
G. divaricatum (Gmelin)- Miyazaki,Hiroshima,Fukui
Volsella modiola (Linne')- Fukui,Fukushima,Miyagi,Aomori,Hokkaido
Panope japonica A. Adams- Fukushima,Miyagi,Hokkaido
Tegula (Chlorostoma) argyristoma (Gmelin)- Chiba
T. (C) pfeifferi (Philippi)- Chiba,Miyazaki,Hyogo,Fukushima,Akita
Batillaria multiformis (Lischke)- Chiba,Miyazaki,Hiroshima,Aomori, Fukui,Hyogo,Akita,Amami-Oshi
Fasciolaria trapezium andouini Jones- Chiba,Miyazaki,Amami-Oshima
Charonia lampas Linne'- Chiba,Fukushima,Amami-Oshima
Thais (Marginella) bronni (Dunker)- Chiba,Miyagi,Fukushima,Fukui, Hyogo,Hokkaido,Yamagata,Miyazai,Hiroshima,
Septifer bilocularis (Linne')- Miyazaki,Amami-Oshima,Chiba,Fukushima

Japeuthria ferrea (Reeve)- Chiba,Miyazaki,Miyagi,Hyogo
Lithophaga curta (Lischke)- Chiba,Miyazaki,Hiroshina,Hyogo,
Aomoti,Fukushima,Fukui
Nerita (Theliostyla) albicilla Linne'- Chiba,Miyazaki,Hyogo,
Amami-Oshima
Turbo (Marmarostoma) stenogyrus Fischer- Chiba,Miyazaki,Amami-Oshima.

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Abnormal Shells of Some Pacific Marine Mollusks

By Dr. H.R. Hill

" The shells of mollusks vary in general appearance,size, structure and color markins. Some species have a normal tendency to vary in the color design of their shells, *Nerita communis, polita,* and *Oliva funebralis.* In others freak markins may occur occasionally or black individuals may be present in a colony of shells which are normally light in color. This black phase, known as melanism, is often present in cowries, olives and other groups.

Variations in the external apprearance of shells are some times due to factors beyond the control of the animals that live within. At times, marine organisms accumulate on the outside of shells and give them an unnatural appearance. Often they are completely covered with foreign material. Among the agents which are responsible for such ornamentation are algae,bryozoans,sponges, worm tubes,corals,hydroids and even the shells of small bivalves. Over one hundred species of microscopic mollusks have been taken from the moss covered back of an abalone shell.

Normal variations in the structure of the shell occur frequently in species that have evidently been influenced by the character of the environment in which they live. Individuals that live on rocks exposed to violent wave action are apt to be provided with thick, rough shells to withstand the heavy pounding of the surf. Others, of the same species, that live in a protected area, such as a bay or cove, develop thin, smooth shells. Many of the limpets and murex shells show a wide range of variation and accordingly have been given varietal names,

The size of the shell in mollusks is affected in some degree by local conditions. Large individuals develop where there is an abundant food supply whereas growth seems to be retarded in a locality where food is scarce. The shape of the shell is also influenced by the character of the habitat, Bivalves that live embedded in restricted quarters or pockets in hard material, become stunted and irregular. Extreme age is accompanied by a great thickening of the shell, especially in oysters and pectens.

There are a great many different types of abnormal variation in the molluscan shell. Among the univalves, the following have been observed.

1. A wide separation of the whorls
2. The shortening of the aperture
3. Excessive number of spines,nodules,ribs or teeth in the aperture
4. Excessive elongation of spines
5. The development of a keel around the body whorl
6. Deformation of the spire or body whorl
7. Development of the aperture on the wrong side.
8. An increase or reduction of the normal number of valves in chitons.

9. Depression of the muscle scar and absence of the dorsal perforations in abalones.

Among the bivalves the following abnormal variations have been observed.

1. Elimination of spines through erosion
2. One valve much smaller than the other.
3. Imitation by oysters of the structure and color of the shell to which they are attached.

Although it is difficult to explain the cause of all of the variations that have been mentioned, there are certain abnormalities that are readily understood. Bivalves and univalves alike, are able to mend their shells when broken or damaged. The method is by replacement of the broekn area or by walling off the damaged portion. Our local Pecten circularis is quite adept at patching up breaks in its valves. A diseased or injured mantle which secrets shell unevenly or lacks the power to distribute color markings in the proper manner, is another cause of abnormality. Cowries often show discoloration due to mantle disease.

Boring organisms and foreign objects lodged within the shell are souces of irritation to many mollusks. As a protection against such intruders, mollusks cover them with a layer of shell and thus set them apart.

Abalones are invaded chiefly by the bivalves, Pholadidea parva and Lithophaga plumula which bore in from the putside. The holes of these borers, small at first, graduallyyincrease in size and depth, until the interior of the shell is reached. It is then that the abalone commences to deposit layer upon layer of nacreous material over the borers thus forming what are commonly called " blister pearls". The red abalone is the species that appears to be most vulnerable to the attacks of these borers and few escape penetration. Blister pearls are also formed over other objects such as sea urchin spines, chiton valves, bits of shell, pebbles, small crabs and sponges. In 1913, the late Dr. Charles Lincoln Edwards of Los Angeles wrote an account of the Abalones of California in which he stated that " sometimes a diseased visceral hump is cut off and covered by nacre, making a huge blister pearl."

Pearl oysters are quite proficient in covering unwelcome visitors. When the souce of irritation is a grain of sand or other small object , layers of mother of pearl are deposited completely around it and a pearl is formed. Larger objects such as sponged, sea weed and boring mollusks are covered by blister pearls, Even small fishes are sometimes caught and excysted in a pearl coating. The little pearl fish of the west coast of Mexico and Central America is accustomed to swim in and out of the open valves of the local pearl oyster, Pinctada mazatlanica. Once in awhile, however, one will penetrate too far and the mollusk retaliates by entombing it alive beneath a pearly layer.

Pectens are frequently bored into by a small excrusting sponge which is able to penetrate to the inside of their shells. However, the sponge never reaches the interior as the pectens s secrete an additional layer of porcellaneous lining to the inside as a protection. Small nodules or pustules roughen the inner sur-

-face of the valves and indicate the presence of the sponge. Cowries cover with enamel any object that is firmly lodged within their aperture or is securely attached, like a barnacle to the outside of their shells.

It is apparent then that many mollusks are able to repair damage or guard against injury but in so doing their shells have been modified. On the other hand, shells become abnormal from unknown causes and it will take a great deal of close observation to discover the why and wherefore of all types of variation."

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In connection with the above paper the following comments by Mr. Cedric Lindsay is of interest. Mr. Lindsay collected the very remarkable specimen due to the extreme elongation that we finally concluded was an abnormal specimen of *Thais lamellosa*.

" As for that aberrant specimen of *Thais lamellosa* that Prof. Kincaid sent you, I happened to pick it up in one of the native oyster dykes in Oyster Bay (Totten Inlet) and since Prof. Kincaid expressed considerable interest in it when I showed it to him, I was glad to give it to him to add to his extensive *Thais* collection."

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Miss Edna T. Cook, 1002 N. Hobart Blvd., Los Angeles 27 submits the following " The following list are additions to those you checked in your list and are in my collection or in the list Mr. Willett Made in the Baldwin Hills. Abreviations N- Nob Hill, T- Timm's Pt., B- Baldwin Hills.

Terebratalia transversa Sby.-t; Laquesus californicus Koch-T; Phylobrya setosa Cpr.-T; Pecten circularis Sbt.-T;Lima dehiscens Con.- T; L. subauricularis Mont.-T; Animia peruviana Orb.-T; Pleurodon (Cyrilla) munita Dall-T;Crenella columbiana Dall-N; Modiolus capax Con.-T;Asthenathaerus villisior Cpr.-N; Crassinella varians Cpr.-T;Poronya tenuiconcha Dall T;Chama pellucida Sby.-T; Lucina annulata Reeve-T; L. nuttallii Con.-T;Aligena cerritensis Arn.- N,B;Laevicardium elatum Sby.- N,T; Macoma secta Con.-N; M. yoldiformis Cpr.-N;Tagelus californianus Con.-N;Siliqua patula alta B & S.- N; Cryptomya californica Con.- T; Corbula luteola Cpr.- T; Acteocina inculta Gld.- N; Volvulella cylindrica Cpr.-B; Haminoea vesicula Gld.- B;Lora kyskana Dall-T;Mangelia hexagona Gabb-N; M. striosa-T;Philbertia affinis Dall-T;Mitromorpha gracilior Hemp.-; Fusinus arnoldi Coss.- T;F. harfordi Stearns-T;F. monksae Dall-T; F. diminutus Dall-T; Nassarius mendicus Gld.-T; Mitrella carinata Hinds-N; M. gausapata Gld.- N,T,;Melanella rutila Cpr.- B; Turbonilla lowei Dall-B;T. ista D&B-B; T. ralphi D&B -B; T. tridentata Cpr.-B; Trivia californiana Gray-B; Alvania compacta Cpr.-T;Crepidula dorsata Brod.- B; C. lingulata Gld.-B; Polinices recluziana Desh.- N; Acmaea cassis Esch.- N; Tricolia pulloidea Cpr.- N; T. substriata Cpr.- N; Homalopoma carpenteri Pils.- T; H. paucicostata Dall-T; Margarites paucipictus Cpr.- N; Vitrinella williamsoni Dall-N; Littorina scutulata Gld.- N; Diala acuta Cpr.- T,B; Mitrella tuberosa Cpr.- T."

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Dr. G. Dallas Hanna, Calif. Acad. of Sci., San Francisco. " I am in the hospital for a few days. Gravel in a shoulder joint-thats all." The " thats all" impresses us that know ' Doc.' because nothing small could lay him low. We hope he is again himself.

Jerry Barhard, 400 Wallis St., Pasadena 2, Calif. Jerry took the course at the Hopkins Marine Station, Pacific Grove this summer, but is now again in Pasadena. The following list is of the animals taken in dredge hauls off the Del Monte shore-June 30 at 8 A.M. Oil shale bottom- 7 fms.- 4 hauls, 15 Min. each. Animals obtained- classifications by Dr. R.L. Bolin. Mollusca- Crepidula adunca, C. exuviata, C. excavata, Saxicava pholadis, Olivella pedroana, Venerupis staminea, Cardium corbis, Solen sicarius, Pholadidea penita, Pododesmus macroschisma, Botula falcata, Acteon punctocoelatus, Leptothyra carpenteri, Pseudomelatoma moesta, Nassa mendica, Aplysia californica, Navanax inermis, Paroctopus apollyon. Platyhelminthes.- Planocera sp. Sipunculoidea- Physcosoma agassizi. Tunicates. Bottenia villosa, Styela simpsoni, Clavelina huntsmani. Arthropoda. Cancer magister, Loxorhynchus crispatus, Cancer productus, Cilicaea granulosa, Mimulus foliatus, Crago nigromaculata, Scyra acutefrons, Pugettia richii. Echinodermata. Pisaster brevispinus, Pycnopodia helianthoides, Ophiothrix apiculata, Dendraster excentricus, Amphipholis aquamata. Annelida. Nereis sp., Cirriformia laxuriosa, Lineus pictriformes, Serpula vermicularis.

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News from and about collectors

Alfred J. Magri, Malta Natural History (Min.) Society, 80 St. John the Baptist St., Sliema, Malta G.C. (Mediterranean). While some members of this organization are conchologists the principal interest at this time seems to be to interest persons wishing to exchange minerals with them.

Dr. Asela B. Franco, Cebu City, Cebu, Philippines. " Since the publication of the Directory I am more loaded with requests for exchanges. I would like to help everybody but I simply cannot afford the time and place for foreign duplicates. So exchangers are please requested to send over exchange duplicate lists. Dead, filed or defective shells will be returned to the sender. I have two other hobbies aside from shells; stamps and orchids. I am a rabid collector in all but my time is very limited. I would like to appeal to exchangers to help me save a little of my time, otherwise I might be forced to stop exchanging.

Fil. Doctor B. Hubendick, Evertebratavdelningen, Naturhistoriska Riksmuseet, Stockholm 50, Sweden. " .... from now on I belong to the staff of the Swedish State Museum of Natural History."

Dr. F. Gordon Cawston, Britannia Buildings, Durban, South Africa. " .... I see from the scientific press that Dr. A.W. Rogers is dead.. the widespread destruction of vegetabl and animal life has resulted in a comparative loss of most of our pond-snails in which I have been interested."

Dr. Rolph Bolin, Hopkins Marine Station, Pacific Grove, Calif. We have an interesting article from the Monterey Peninsula Herald entitled " Bolins Ready for World Trip- Will Start Out on Freighter Dr. Bolin left on a world trip under a Guggenheim Fellowship to study his specialty- lantern fishes. Dr. Bolin will be accompanied by Mrs. Kathryn Bolin, his wife who is also his secretary. A photograph of his laboratory aboard ship is shown. The itinerary is somewhat amazing including Australia, India, and all points including what looks like everywhere in Europe.

Those of us who were fortunate enough to hear Dr. Bolins lecture at the meeting of the A.M.U. will appreciate his fish.

Mr. A. Sorensen, 247 Granite St., Pacific Grove, Calif. " Dr. Bolin tells me that he will spend three months at the University of Copenhagen, my old Alma Mater. That interests me as I have never been back. Mr. and Mrs. E.W. Boerstler of Corona Del Mar stopped in for a brief visit as they also did at John Strohbeen's in Santa Cruz on their return from Klamath River where they reported poor fishing this year.

Dr. E.W. and D.S. Gifford, 2535 Le Conte Ave., Berkeley 9, Calif. Dr. and Mrs. Gifford have just returned from an archaeological expedition for the university to the Fiji Islands. " ... Besides olives, we brought home some Fijian cowries and other shells all from Viti Levu. Olives were scarce and difficult to find. The natives eat them along with virtually all other mollusks of sufficient size."

Marshall Sohl, Zamboanga, Pasonanca Park, Philippine Islands. It seems to me that our member Sohl was at the last meeting of the club but we are now informed that he is permanently located at Zamboanga. It is a safe wager that he will be responsible for putting some really fine shells in circulation.

Leslie Hubricht, 101 Grenville St., Battle Creek, Mich. " ..I have spent the summer collecting Campeloma in all of the lakes and rivers that I could get to in S.W. Michigan. I have come to the conclusion that there are only two species here- C. rufum and C. decisum.

Mr. A.S. and Adele Koto, 1421 Roosevelt Ave., Beloit, Wisonsin. We are advised that they are leaving shortly to spend the winter in Florida but do not as yet have their Florida address.

Don Smith, 5930bBarton Ave., Los Angeles, Calif. We were very s sorry to hear that Don has been ill and is in the hospital.

C.E. Fox, Siota, Solomon Islands. " I had to go to Sydney last September for an operation which proved to be a big one and was in the hospital in November, got across to N.Z. for Christmas with my sister and two months rest and then off to come back here which took 3½ months from Auckland; the only link with the outside world is now a little boat of 190 tons whicg goes " occasionally" between here and Fiji and mails are only every few months. ... it looks hopeless to answer all the letters-.. moreover I have to move soon to Malaita an island 30 miles away to live there. I find my shell collection in great disorder. Some white people had got in, disarranged everything and taken away some of the best. Nevermind that, I hope to set about getting it in order soon and ..."

James L. Creelman, 2214 Logan Ave., San Diego 2, Calif. " ..My first love was seashells but in 1932 my son started chasing butterflies and I followed him... I go to the seashore at least once every two weeks for abalone and lobsters and while there my old weakness for shells gets me. I work Point Loma and if I can help you or any of your fellow collectors let me know."

Miss Edna N. Wilson, 2753 Ocean Front, Mission Beach, Calif. " Stop in and see me sometime". Miss Wilson's new address.

J.S. Gaylord, 147 8th Ave., North, St. Petersburg, Fla. The above is Mr. Gaylords winter address. He is from E. Longmeadow Mass.

[illegible] 227 South St., [illegible]
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[illegible] by [illegible]
[illegible] been broke. [illegible]
In [illegible] which [illegible]
[illegible] their return from [illegible]
[illegible] years [illegible]

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[illegible] for the university to Fiji Islands." [illegible]
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[illegible] Viti Levu. Others were [illegible]
[illegible] natives [illegible]

[illegible] that your brother [illegible]
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rivers that I could not [illegible]
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[illegible] in November, [illegible]
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[illegible] months from Auckland [illegible]

[illegible] between here and Fiji and [illegible]
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[illegible] and get it, [illegible]

[illegible] 2911 Logan Ave., [illegible]
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John Dyas Parker, The Academy of Natural Sciences of Philadelphia
Dear John: Will endeavor to let you in on what goes on at the academy. We are head over heels in work here as we have had a couple of unfortunate occurances here. Dick McLean who was our Pelecypod man has gone ontto Dartmouth and more pay, for which I cannot blame him. However, this is our great loss as Dick, besides being a very careful worker, was fast becoming an authority on West Atlantic Pelecypoda.

Our next great loss was Chuck Wurtz. Chuck was working in Tuckaleechee Cove in the Great Smoky mountains when he was shot by moonshiners. The bullet went right through his right knee. Thus was terminated a fourteen week field problem in two weeks. He spent another two weeks in Marysville hospital and then came back to Philadelphia. At first doctors despaired of his ever doing good field work again as the lower part of the knee cap was furrowed and the ligaments were just about cut through. The leg was put in a cast and eventually the ligaments strengthened. Now it seems fairly certain that he will again regain complete use of his leg.

On the other side of the ledger we have the glad return of Dr. Pilsbry from the Peruvian Andes loaded down with shells, many of them new. Although Dr. Pilsbry is better than 84 years old he completely tired out the Peruvians who went with him snail hunting. They often refused to go up the sides of cliffs with him but he went anyhow and brought back some fine land forms. At Present Dr. is just putting the finishing touches to the Succineidae of his Monograph of the Land Shells of-North America North of Mexico. This is the last family to be treated so you may look for the completion of this monumental work in the near future. In fact better than half of the book is already in proof.

Dr. H.B. Baker is completely metamorphosed from his bachelor days for he is quite content to stay close to home, which means Bonnie and the two sprouts. He did a monumental job on the Nautilus recently and managed to catch up on the publication date of that journal. The index that he worked up took many weeks of labor which most folks can not begin to appreciate.

Recently we had a visit from M. Gilbert Ranson of Paris. He is hard at work on oysters and spent some few hours on our Ostraeidae. We found him a very charming and talented worker. Although we have long correspondence with him this is the first time he has met any of our staff. Dick McLean came down from Dartmouth in time to see him before he left.

Another visitor here lately was young Dr. L.B. Holthuis of the Leyden Museum in Holland. He was interested mainly in our Balaeonomidae. It was hoped that he might get out in the field with our group but to date we have not been able to contact him again.

A.A. Olsson has returned from South America and has just bought a house on the outskirts of Philadelphia. Although he has been a research associate of ours for some time his new house puts him within commuting distance of the Academy so we see him more regularly now.

Dr. Teng-Chien Yen of the Geological Survey, who worked here several days a week has left the United States again, this time for Europe. The last I heard of him he was somewhere in

Scotland.

Mr. and Mrs. Charles R. Locklin (She used to be Marion Castor, Dr. Pilsbry's assistant) were in town last June. They were on their way back fn Florida to their Detroit homes. On the way they stopped at several famous collecting spots of Conrad, and Toumey and Holmes in Darlington, North Carolina and hauled out several tons of Tertoary deposits which are on their way to the Academy. Before doing this however, they spent several weeks in the fieldat ten mile creek locality of the Chipola deposits of Florida Miocene. This locality was first discovered by Burns and the material worked by Dall. They also visited the Miocene deposits at Jackson Bluff and Harvey's Creek in Northern Florida. Several tons of material was collected on each trip.

Mr. W.G. Fargo is again active and he is still continuing his work on the Florida Pliocene Turridae. At present he is in Jackson, Michigan but will soon be returning to his lovely home in Pass-a-Grille, Florida.

Miss Anne L. Harbison has just returned from a vacation in the far west and is already to start work again on the Fargo collection of St. Petersburg, Florida, Pliocene material now deposited at the Academy. Great strides are being made in the classification of this collection and both she and Mr. Fargo are looking forward to an early publication date.

Dr. J.S. Schwengel has not been around the Academy much this summer as she and the Geheral have sold their beautiful Scarsdale, New York home and have purchased a small farm above Greenwich, Conn. She had just completed revising the Cypraea in our cabinets.

Robert C. Alexander has been down at Cape May, New Jersey all summer where he has been pumping life into the new Cape May Geographical Society. He is Vice President of this group and has been conducting nature walks along the shores of the Atlantic Ocean and Delaware Bay.

I have been busy this spring with my own class in Marine Invertebrates which will be repeated this fall. I also hope to have another course ready too, this one in Physical Geology. Toward this end I have been busy with my camera and have hundreds of colored slides ready. In the spring course I showed over 400 feet of colored film showing snail, clam and other sea life in action. The movies also showed actual dredging operations in Florida, the use of traps, sorting microscopes and other phases of collecting. These were augmented with two hundred color slides and the actual specimens of everything mentioned in each lecture. I had lots of fun planning and giving this course.

We were all sorry that we couldn't get to the A.M.U. convention. Although we were all anxious here to have a meeting on the West Coast so that you folks would not be shut out we were all unable to attend because we had only two week vacations and none of us had the price of an air ticket. We are glad that it was such a success though.

P.S. At the Academy we have a file of pictures of Conchologists which is renewed every twenty five years or so. This file includes such personages as Say, Conrad, Rafinesque, Tryon, I. Lea, Pfeiffer C.B. Adams,Hugh Cuming,LeSueur,Phillipi, and others. I am starting to again revise it and have present day photos of only a few of

our correspondents. Not a single west coast conchologist is included in our present day collection and I wonder if I might persuade you to play missionary for me and dig up a few pictures. I want one especially of yourself. Any sort of a picture will do as all the photos are recopied to a standard size. Signatures will be appreciated too.

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Dr. J.S. Schwengel and General Schwengel have been on an extended trip to Europe and on their return will make their home in Greenwich Conn.

E. Sidney Marks, Florence Ave., Leonardo, New Jersey. Note the new address.

F.S. Ruth, Monterey Peninsula College, P.O. Box 1031, Monterey, Calif. " Have just returned from a summr spent teaching Marine Zoology at the new Pacific Marine Station at Dillon Beach, Calif."

Frank Lyman, Lantana, Florida. Frank's latest offer is some fine collections of Unionidae. If you are the slightest bit interested in this beautiful group of shells you had better write him for his offer.

Paul H. Reed, Tavares, Florida. Publisher of Mollusca $2.50 per year and worth it. Mr. Reed is offering an interesting form of blank loose leaf printed catalogue sheets to systematize shell collections. Those who are starting new collections or who do not have a well worked out system now should by all means inquire about these pages.

E.V. Edmonds, 1933½ Russell St., Berkeley 3, Calif. We enjoyed a visit from Dr. and Mrs. Edmonds recently and they got in one good days collecting in Newport Bay.

Ruth E. Coats, 702 E. First St., Tillamook, Oregon. Miss Coats recently returned from a trip to New York. She is continuing her work on west coast fresh water forms.

C.L. Blakeslee, Pittsford, New York. " ... I am getting in the last of the seasonal collecting before old man winter jumps from behind the corner. The season out here, for me, has been poor. Too much high water and then just as it gets to a reasonable collecting depth a severe frost shoots nearly everything under cover. So I start planning for next year. A microscopic form that I get from a nearby pond is Armiger crista. They may be found this time of the year on decaying pickeral leaves after they droop into the water. If I found six in a days work I would feel repaid. Last year the pickeral leaves decayed before I got around to examine them. So I told myself to be on the job next (this) year. I have been watching the pond for the past few days, the leaves are drooping, but not a sign of an armiger. So it goes. Now another year's wait. That is collecting. Two years ago I caught the leaves with an abundance of small shells on the under side. Picking the leaves, bringing them home, removing the shells to a microscope slide and examining them under the lens gave me three Armiger out of a thousand shells. Over four hour's work but it was worth it.

Eugene H. Schmeck, 8711 Buffalo St., Niagra Falls, N.Y. Mr. Schmeck had a bit more than his share of trouble in the way of motor repairs on the way home from the A.N.U. convention but finally made it. We are sorry because we certainly wish none of our friends to get discouraged about paying us visits.

Mrs. John Q. Burch made a fine trip by air down to Guatemala City, Guatemala to visit Dr. Thomas A. Burch, Beatrice and of course, John Q. III and Ruth Janthina. Mrs. Burch returned with baskets and pockets full of rare shells and so many other things that it must have consumed pages of the customs invoices. On the way to and from Guatemala she enjoyed pleasant visits in Mexico City with Miss Marie E. Bourgeois, 3a Tiziano #35 and with Mr. and Mrs. Donald B. Cordry, all enthusiastic collectors. Mr. Cordry sent by Mrs. Burch among other interesting things a set of such fine specimens of Turritella that I was interested in sending t them to Dr. Hertlein for examination. They came from Acapulco.

Dr. L.G. Hertlein, Calif. Acad. of Sciences, Golden Gate Park, San Francisco, Calif. " These are *Turritella mariana* Dall. *Turritella radula* Kiener may turn out to be an earlier name for this species but that point is not positively settled as yet."

Dr. R.P. Burke, 614-15 Bell Bldg., Montgomery, Alabama. It is of interest that Dr. Arthur Woodward, curator of archaeology and history at the Los Angeles Museum, made a special effort to examine the collection of Dr. Burke in Montgomery seeking data for his book on " Trade Silver of the East." This was our first information that Dr. Burke was a collector of Indian artifacts. Dr. Burke is, of course, an enthusiastic conchologist and has one of the finest collections in private hands in the country.

Dr. Alexander Comfort, 20 Honor Oak Road,Forest Hill,England. " I am sending some shells ... The only thing of interest is the aberrant *Mya* and *Scrobicularia* from Seasalter Bay,Whitstable: these approach the brackish form. I think they are ecotypes due to the stones in the top layer of the mud. I am collecting at Gairloch this year- if you want anything for which I could look out, please let me know. I much appreciate having your Bulletin - my own work is largely on the biochemistry of shells, examining them by ultraviolet light and so on, but I follow the systematic side as best I can. ..."

Mrs. E.C. Elliot, 1 Marden Road, Payneham. South Australia. We note from a letter sent us some time back that while Mrs. Elliott is not interested in exchanging extensively having done do with a host of collectors over here she is interested in fine Conus.

Dr. Charles D. Chessex, Montolivet 30, Lausanne, Switzerland. " I am a dentist with an American degree which I took at Penn in 1921, 46 years and the father of 3 big boys. I started collecting shells when the children were small, but they soon lost interest in it, unfortunately; they are much more interested in sports than in nature, as their father. Meanwhile I developed a heavy interest and love for ornithology, and my bird studies soon took up most of my time. And now , I am the chairman of a very large society, for the study and protection of birds, which encloses all the French speaking part of Switzerland. This all gives me a lot of writing and the shell collections have been somewhat neglected. Anyhow, I sort of keep an eye on it, and am still regularly keeping correspondence and exchanging specimens with Mrs. Worthy of Auckland, New Zealand and Mr. Saxton of Sarasota, Florida. Unfortunately since the war broke, I have been unable to go back to France or to Italy, and I am reduced to what I can

collect around here in Switzerland, As you know, we have no sea, and we are confined to land and fresh water specimens. However, I hope to be able to make arrangements with somebody in Algeria to send me some Mediterranean shells also. Our local fauna is rather reduced in the number of species and individuals; moreover I have but little time to go collecting. Here is a list of the shells I am able to get around here..." Dr. Chessex attaches a very interesting list of land and fresh water species which he has for exchange.

T. Pain, " Regency House", 71 Gower St., London, W.C. 1, England Mr. Pain is particularly interested in securing specimens of Ampullaria (Pila) and Placostylus. And our sincere thanks for the following encouragement " Do not be put off by snobs who do not like your efforts because they are mimeographed and not printed. Many of the so-called first class printed journals contain a great deal more " tripe" than has ever appeared in your paper."

Minutes of the Conchological Club of Southern California

September meeting- The September meeting was called to order by the chairman Dr. W.O. Gregg. Nineteen members were present. We welcomed some new faces and missed some old faces. Among the new were Mr. and Mrs. Howard L. Fletcher of Redlands. There were no reports except the treasurers, so the meeting was turned over to Mr. Harry C. Turver, who from maps and field notes gave a most interesting talk on " Ecological Observations of the Guaymas Area". Respectfully submitted, Harriette Gillis, Secy.

October meeting- After calling the meeting to order Dr. Gregg welcomed Mr. Richard C. Dinkins, a former member long absent and Mrs. John Q. Burch just returned from a trip to Guatemala.

There was an informal discussion on pronunciation of Latin names with the consensus of opinion that common usage as used by Webster's dictionary should govern.

Dr. Gregg referred to a new leaflet by Dr. Berry " On the generic relationship of certain Lower California Helicoid snails" In the discussion that followed we were reminded that Junius Henderson used to say " We are all inclined to be splitters in the group in which we work particularly and lumpers in all others."

Mrs. Burch told of her plane trip to Mexico City and the cordiality of the shell collectors there, Mr. and Mrs. D.B. Cordry and Miss Marie E. Bourgeois, and of the excellent work done by them on the fauna and land shells of Mexico. She told of the joy of seeing Captain and Mrs. Thomas A. Burch and the grandchildren, of the beauties of Guatemala and of collecting elusive Drymaeus lilacinus under the cypress trees and Pachycheilus largillierti on the rocks in the fresh water . Specimens of these she kindly distributed among us.

Mr. Morris Caruthers gave an interesting paper on Haliotis showing many beautiful specimens. During the general talk that followed Mrs. Chace told the old " fish story" of two collectors spending the night on a beach who were awakened by a swishing sound and then in astonishment watched an army of abalones move across the sand. Respectfully submittes, Harriette Gillis, Secy.

Some New Publications Received

Champion, Merrill E. : Edward Sylvester Morse With a Bibliography and a Catalogue of his Species. Occasional Papers on Mollusks. Vol.1, No. 11, Sept.20,1947. Harvard University.

Johnson, Richard I; Lampsilis cariosa Say and Lampsilis ochracea Say. Occasional Papers on Mollusks. Vol. 1, No. 12, Sept.22, 1947. Harvard University.

Powell, A.W.B. : Native Animals of New Zealand. Auckland Museum Handbook of Zoology. 1947. An illustrated booklet of 96 pages covering all groups, including the mollusks.

Berry, S. Stillman: On the Generic Relationships of Certain Lower Californian Helicoid Snails. Leaflets in Malacology Vol. 1, No. 3, Oct.1,1947.

This paper is of particular interest to all students of our desert land fauna. A new genus *Sonorelix* is described to cover a group of species until now considered *Micrarionta* but recognized by all students to bear certain definite resemblances to *Sonorella.* And a new subgenus of Sonorelix , *Herpeteros* is now described in this paper. *Sonorelix* was described by Dr. Berry in 1943.

Coe, Wesley R. : Biology of Crepidula williamsi, a new species of prosobranch gastropod from the Pacific coast. The Journal of Morphology Vol. 81, No.2, Sept.,1947.

This is a well written paper well illustrated including excellent figures of the anatomy. Naturally we will all of us attempt to learn to separate this newly described species from our collections where we no doubt have it now labelled either *nummarius* or *nivea.* The addition of this new species to our local fauna in this group will be of particular interest and especially to those and they are many who have insisted that we have but one species and too many names now. But Dr. Coe makes an excellent case for the new species and we are all eager to see either a paratype or a specimen of it classified by Dr. Coe.

Bibliography of North American Geology,1944 and 1945. 1947 496 pages. Geological Survey. Bulletin 952. Price $1.00 . Catalogue No. I 19.3:952. Includes paleontology,petrology and minerology lists publications on the geology of the Continent of North America and adjacent islands and on Panama,Hawaii and Guam.

Bulletin- The Natural History Museum of San Diego. Oct.,1947. The museum building has finally been cleared of all Navy installations and is being repaired and made ready for the museum to resume its former space.

An interesting little note in this bulletin mentioned the collection by Miss Bristol and Mr. Huey of *Physa* from San Diego Co. with a large percentage of them parasitized.

Pemberton,C.E.: The Giant African Snail Achatina fulica (Fer.) The Hawiian Planters Record. Vol.XLII,No.2,1938. Not new but a particularly well illustrated work on this species.

Revista De La Sociedad Malacologica " Carlos De La Torre" Vol.5, No.2, Oct.9,1947. Another excellent issue of this periodical. Amomg the papers of particular interest are: Desarrollo de Zachrysia bayamensis by Luis Howell Rivero; Nuevos Gasteropodos De Cuba by Carlos G. Aguayo and Miguel L. Jaume (several new land shells described and figured) ; The West Indian Marine Shells by Henry Krebs (a republication by W.J. Clench, C.G. Aguayo and R.D. Turner).

All serious students should subscribe to this paper- write Miguel L. Jaume, 13th St., No. 351, Vedado, Havana,Cuba. Price .60¢ per issue.

Catalogo De Los Moluscos De Cuba by C.G. Aguayo and M.L. Jaume. This new work has been announced and work started. The price is $3.00 for each 200 pages. Orders should be sent to M.L. Jaume at the address given above.

E.A. Andrews: A folliculinid from India. Science Vol. 106, No. 2746, Aug. 15,1947.

Circulares De La Sociedad Malacologica " Carlos De La Torre" Museo Poey, Universidad de la Habana, Cuba. These are mimeographed sheets but contain many very interesting items not only personalia but discussions of publications both old and new. The volume of these may be seen from the fact that we have on our table for review at this minute exactly 70 pages of them. Among many other items of particular interest is an account of the war damage done to many of the museums and institutions of Europe.

Annales Historico-Naturales Musei Nationalis Hungarici- We were particularly interested in these fine papers recently received because they were published in Hungary during the war.
Zur Micromorphologie Des Fusses Der Patelloiden by Von. M. Rotarides (Budapest). 36 pages and 3 pp of plates. 1945.
Die Methode Des Bestimmens Pleistozaner Mollusken. by M. Rotarides. 1943 . A beautifully done booklet. 53 pp, 8 plates, many figures.
Uber Das Photographieren Von Schnecken-Und-Muschelschalen. by M. Rotarides (Budapest) 1943. 22 pp and 2 pp of plates.

Boletin De La Real Sociedad de Historia Natural- Madrid, Spain (Museo De Ciencias Naturales). July,1912. While this is far from a new publication and it is interesting to note that the society publishing it was founded Feb.8,1871, it is at least new to our library. A number of interesting papers in Spanish and two pages of remarkably clear plates.

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U.S.S. Russia

We all get our fill of international complications without comments by the editor of this small journal. However, our experiences may be of slight interest to some. At intervals for the past several years we have mailed copies of our Minutes, Directory, and inquiries to Russia. They were not returned but neither did

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we ever hear a word. All inquiries simply dropped out of sight. It may be mentioned here that this seems to be the only country on earth that has not cordially replied to such notices. Recently we wrote a mention of this to our friend Dr. Hans Schlesch in Copenhagen,Denmark and his reply follows: " Yes, there are various workers in Russia, t. exp. Shadin in Leningrad, Decksbach in Moscow, Owtschinnikoff ,Kozoff etc. , but I understand very well they do not write. U.S.S. R. is a closed country." " ...I fear it is impossible at present to come in touch with them, since I am told they would be put in prison, if they write or receive letters from foreign countries, therefore I only addressed my last publications issued during and after the war to the Academy of Science, Department of Malacology, Leningrad, U.S.S.R. and hope they came into the hands ..."

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Prof. Dr. Wilhelm Kuhnelt, Zoologisches Institut der Universitat, Wien 1, Dr. Karl Luger Ring, Austria. " I was very glad to receive a copy of your Directory of Conchologists and I am interested in your future offerings. But there is no possibility to send money from Austria to the U.S. at the present time. In this line I want to ask you whether you are interested in shells of Central Europe, especially the eastern Alps and the northern shore of the Mediterranean. Possibly I could send you some interesting species from endemic groups like Cylindrus,Campylaea, and Clausilia. There are also available the common species of the Mediterranean Sea and a limited number of specimens from the coast of Ceylon. If you would like to arrange an exchange, I should like to get land shells from the western U.S., especially Oreohelix and allied genera."

We are sending Dr. Kuhnelt a series of Oreohelix etc. and hope that he finds them of interest.

Walter J. Eyerdam, 7531 19th Ave., N.E., Seattle 5, Wash. Mr. Eyerdam asks a few questions that will perhaps be of interest to others. The " Eastern Pacific Expeditions of the N.Y. Zool. Soc. Mollusks of the West Coast of Mexico and Central America" by Hertlein and Strong. * A limited number of copies of these separates are available from the California Academy of Sciences, Golden Gate Park, San Francisco, Calif. - price 50¢ each.

" My wife and I have sent about 250 food and clothing packages to various relatives and friends in Germany and other countries that have been bombed out or otherwise have been rendered destitute. We get letters nearly every day acknowledging in the most grateful manner the small help that we have done. I have also sent a few packages to some of my former conchological friends whom I knew had lost practically everything. I am sending you three letters that I have just received and perhaps you may wish to print them in the Minutes. Dr. Rensch and his wife had been among the leading malacologists of Germany when I visited them and Dr. Thiele at Berlin Zoological Museum in 1930. Frau Ilse von Rensch made the report on the Papuinas that I collected in the Solomons and named one of them Papuina eyerdami. Herr Hans Modell is one of the leading world authorities on Unionidae and you know Mr. Kinoshita through former correspondence. Perhaps if you publish these letters it may induce other members to send food packages to these worthy but unfortunate people and others in like

circumstances. You will also note that they will not accept charity but wish to send shells and literature in return when conditions permit. I believe that the reason you are not able to send shells to Germany is because transportation is still so very limited for traffic that only the barest necessities are permitted to be sent. It is, however, permitted to send scien--tific literature out of Germany. Recently I received a package of shell literature from Dr. Rensch.

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ABS. Prof. Bernhard Rensch , (21a) Munster (Westf.), Museum Fur Naturkunde, Himmelreich-Allee, Aus Der Britischen Zone.
Herr Hans Modell, Lindau B (14b), Schulstr. 11, Germany, French Occupation Zone.

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St. Petersburg Shell Club- 3513 2nd Ave., So , St. Petersburg 7, Florida. The preliminary notice of another great shell show to be held in the Great Ball Room of the Municipal Pier. The show will be for one week beginning Sunday, Jan. 20.

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Prof. Herman W. Miller, Apartado 1320, San Jose, Costa Rica. " While taking an enforced vacation (undulant fever) will try to drop you a lihe. As to the question " To print or not to print" I will tell you what I think about it. My opinion won't mean anything to anybody, but at least it will let off steam. If an article is worked up by a careful scientist, I can't see what difference it makes whether it is printed or mimeographed. I think any publication of a responsible group (such as the Club) making a careful study, should be recognized, if it has suffi--cient circulation to make it available to scientists and students. I can see why no one would want me, for instance, to put out a mimeographed sheet every time I have an idea and expect it to be recognized, but the argument would still be good against my having it printed if I had the money to do so, which I suppose I could do, judging by the conflicting opinions which do get into print. I think it should depend on who takes the responsibility for the publication and unless there should be established some single publication in which all new descriptions and names would have to be published (with plates or illustrations by the way), I don't see why science should be limited to those who have money to print things or who would rather spend it that waythan in getting out on some trip to learn something new and interesting to publish. If you do print anything please let me know. Person--ally, I am in favor of some such publication as I have mentioned above, or of regional publications including everything in the region (like Johnsonia). I would surely be interested in some publication of similar quality on the Panamic region, describing and illustrating all the species outlined in the Minutes and also the Pelecypoda down to Panama.

In comparing your Minutes with Pilsbry and Lowe's Paper and Maxwell Smith's book I find three different authorities for the name Strombus granulatus. Is there any way a mere collector can tell who is right ? That is not the only name disagreed upon.

* An interesting point. I have always used Gray but note Max--well Smith uses Mawe placing Gray under in the synonymy. ??

Does either Baily's or Oldroyd's book have illustrations or good descriptions in English of species found south of San Diego?: Do you know of any other good book that does ?

* No to the first two questions other than the comparatively few species which range on southward from San Diego. The last may be covered in the large general works such as the Manual of Conchology, Reeve etc. but the literature is scattered. Maxwell Smith's book is the best we have now.

I have a shell which was identified some years ago as Latirus knorri Rve. I do not find that name in the key to species published in the Minutes. Can you tell me anything about the synonymy of this name ?

* My index cards fail to show this species. Perhaps some other member can help us.

What are the key differences,if any, between Mitra swainsoni Brod. and M. zaca Strong, Hertlein and Hanna ?

* In M. swainsoni you have fine axial sculpture, in M. zaca all axial sculpture is absent. Zaca is a larger shell and from the Gulf. You probably have swainsoni. There are other differences

I would like to know if the following represent extension of range. When Maxwell Smith was here I found at the Boca de Barranca, near Puntarenas, a young specimen of Epitonium crenimarginatum Dall with a hermit crab in it.It probably was a local specimen as it is in better than fair condition and in a place quite far from where boats from other places pass, so could hardly have been from ballast. Then about a week ago, near the same place, I found a young hermit crab specimen of Epitonium strongi Lowe. I havent seen any record of either this far south.

* They are extensions of range for my records if you are positive of the identifications but perhaps you might well let Mr. A.M. Strong take a look at them. He is our recognized authority on this group as well as many others of course.

But hold your hat for a minute on the Epitonium creniargin-atum Dall. In the first place we have raised the subgenus as used by Dall, Opalia to generic standing. Next we have placed crenimarginatum in the synonymy of the species insculpta (Carp.) thus coming up with the name for this shell Opalia insculpta (Carpenter).

I have been intending for some time to ask you about the species Littorina aspera Philippi. I have noted on two different occasions when I have reported it, when putting it into the Minutes you have changed it to L. aspersa. I know there is a Helix aspersa and probably several other aspersas but I always thought this one was aspera, meaning rough. Please give me the latest on this as I want the right name. The other one is L. conspersa Phil. I suppose that means scattered with, as there are always a few scattered among the asperas down this way.

* The L. aspersa is purely the fault of our non existent proof reader and having Helix merrily eating up my garden just outside the door. The correct word is, of course, aspera. Now regarding the Littorina conspersa. Mr. Strong considers this a distinct species and we follow him. Of course, a host of authors have Littorina aspera conspersa Philippi considering conspersa a subspecies or variety of aspera.

STUDIES IN AMPULLARIA

By E.G. Alderson M.A.

19 plates (Quarto) 1925
A Limited edition of 150 copies. A few copies available at $6.00 post free.

WATKINS AND DONCASTER
36 Strand, London W.C. 2- England

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Prof. Herman W. Miller, Costa Rica. We had no sooner cut the stencils for this issue including the letters from Prof. Miller when we were surprised to find him in the White Memorial Hospital here in Los Angeles. However, he is recovering from his illness and we hope to have him with us shortly.

Dr. Jeanne S. Schwengel, Belford Road, RFD #4, Greenwich,Conn. This is the address of the new home.

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Anyone interested in the oyster problem discussed in this issue may have the following by writing to John Q. Burch, 4206 Halldale Ave., Los Angeles 37, Calif.

Ocenebra japonica Dunker .50¢ each. This is the imported Japanese oyster drill.
Thais lamellosa (Gmelin) .50¢ The local species.
Urosalpinx cinereus (Say) .25¢ each. Eastern drill.
Ostrea laperousii Schrenck $1.00 The Japanese oyster. Large complete frilly shells. 4" and up.

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A few new books just published that may be of interest to some may be had by writing John Q. Burch at the above address.

Morris, Percy : A Field Guide to the Shells $3.50.
The Peterson-edited Field Guide series is well known. The new 1947 Field Guide to the Birds $3.50 is without a doubt the most popular bird book in print. The book is now delivered and has met with universal approval. 400 shells are illustrated with 102 shells shown in full color.

Putnam, George Palmer : Death Valley handbook. $2.00
A guide to the flora, fauna and minerals of the Death Valley region.

Bent, Arthur Cleveland : Life Histories of North American gulls and terns $5.00. This is a reprint of Bulletin 113 of the U.S. National Museum which has long been out of print and has been selling on the ' out of print' market for rather fantastic prices. Bent's first work " Life Histories of North American Diving Birds" $5.00 was also recently reprinted.

These are beautifully illustrated volumes and recognized as the authoritive works on these birds, and while bird books as a rule might be out of place in a shell collectors journal,these books cover the very birds seen by shell collectors on their collecting trips and it seems fitting that we should know about them.

OUT OF PRINT BOOKS

A few of these rare books may be of interest to some here. Those interested in more complete lists including separates and journals will please inquire from John Q. Burch, 4206 Halldale Ave., Los Angeles 37, California.

Reeve, L. and Sowerby, G.B. Conchologia Iconica. Figures and descriptions of the shells of mollusks, with remarks on their affinities, synonymy, and geographical distribution. Complete in 20 volumes, with 2727 hand-colored plates. Quarto (11 x 8½ inches(. Cloth 1843-78. $1,150.00

Hirase, Shintaro : A Collection of Japanese Shells. $15.00
This is the book with the 129 beautiful colored plates. This volume is in new condition with original wrapper.

Forbes and Hanley: British Mollusca 1852 . 4 vols. Cloth. $30.00

De Blainville, H.M.D. : Manuel De Malacologie 1825. 645 pp and chart. Separate from the vol. Plates 1-35,36-70,71-87 $50.00

Wood, W. : Index Testaceologicus : or a Catalogue of Shells British and Foreign, with the Latin and English names. Second edition, with supplement, many coloured plates. 2 volumes. Octavo. Cloth. 1828 $45.00
Wood, W, : General Conchology. 1835. 246 pp text, 59 pages of colored plates. $30.00

Poe, Edgar A. : The Conchologist's First Book. 1840 $12.50

Brown, Capt. Thomas : The Conchologist's Text Book. 1836 180 pp $7.50

Gould, A.A. : Lamarck's Genera of Shells 1833 110 pp $7.50

Gualtieri, Nicolai. Index Testarum Conchyliorum, quae adservantur in Museo Nicolai Gualtieri, exhib. Tab. CX. Firense,1742. Folio XXIV,Frontisp.,Portrait,110 beautiful plates and several vignettes, all engr. by Ant. Pazzi and with supplementary text. $50.00

Scilla,Augustinus : De corporibus marinis lapidescentibus quae defossa reperintur... addita Dissertazione Fabii Columnae de Glossopetris. Romae,Monaldini,1759. 4 to. Old boards. 4 leaves 82 pages, 3 leavesa and 28 plates. $25.00

Adanson,: Histoire naturelle de Senegal. Coquillages. Paris, Bauche,1757. 4 to Contemporary binding, marbled calf, gilt back. 4 leaves, 190,96, 275 pp, 19 plates and map. $50.00

MINUTES 75
DEC 1947
CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA

Subscription $2.50 per year

We are now meeting the first Tuesday of every month at 7:30 P.M. at the Los Angeles Museum, Exposition Park, Los Angeles, California. All interested persons are cordially invited.

Please mail all news to your editor,

John Q. Burch,
4206 Halldale Ave.,
Los Angeles 37, Calif.
Telephone Ax. 2-7965

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A New Name for Our Familiar Pink-mouth Murex of the Gulf of California, the *Phyllonotus bicolor* of modern writers.

Dr. A. Myra Keen wrote us Nov. 21,1947 " Dr. Joshua Baily spent a week here recently and in the course of his work noted that *Murex bicolor* Valenciennes,1832 is preoccupied. Grant and Gale caught this also, but the name they selected to replace it is also a homonym (*M. hippocastanum* Philippi,1845, not Linne,1758) A bit of search has turned up another name which should be used anyway, as it has priority over that of Valenciennes; namely, *M. erythrostomus* Swainson,1831 (Zool. Illust., ser. 2, vol, 2, pt. 16, pl.73), type locality not given. The figure is unmistakable; oddly enough, Dall (Proc, USNM, vol. 37, 1909, p. 287) recognized the identity of the two but did not realize that Swainson's name had one year's priority."

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" One of your correspondents asked (p.24, of Minutes 74) for a reference to *Latirus knorrii*. This is *Latirus cinguliferus* (Lam.) var. *knorrii* (Deshayes), edition 2 of Lamarck's " Histoire des animaux sans vertebres", vol.9, 1843, p. 391; type locality,Florida.'

Mr. Morris Caruthers at a recent meeting of the club gave an interesting program on the genus *Haliotis* in which he elected to use the genus *Teinotis* with type *H. asininus* and setting the species *H. tuberculata* as the type of *Haliotis* s.s. This caused a discussion and disagreement. The problem was submitted to Dr. A. Myra Keen whose opinion follows: " As to Mr. Caruthers worry over the type of Haliotis: you might explain to him that if an author does not in his original description of a genus designate a type species, the first subsequent designation by some other author is binding. The first formal selection of a species of *Haliotis* as type of the genus was made by Montfort in 1810. He definitely stated that *H. asininus* Roissy(= *H. asininus* Linne,1758) is type. Hence, any later transfer of this species to some other genus (as *Teinotis*) or any other designation of a genotype (as *H. tuberculata*) is invalid. If someone could find buried in an obscure piece of literature published prior to 1810 a clear-cut designation of some other of Linnaeus' species as type of the genus, of course this would take precedence over Montfort's designation. However, in this case it is rather unlikely, as the word type was rarely used in the early part of the last century."

In the Minutes no. 74, p. 23, someone inquired as to the correct authority for *Strombus granulatus* which is variously attributed to Wood, Gray and Mawe. The first description seems to have been made by none of these but by Swainson,1822 (Appendix to the sale catalogue of Mrs. Bligh's shells, p.8). Carpenter so attributes it in his 1872 Smithsonian reprint, p.6, and in the Mazatlan Catalogue, p. 382, but elsewhere cites various authorities, even Sowerby."

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Professor *Trevor Kincaid*, University of Washington,Seattle Washington recently sent us a box of juvenile specimens of the so called *Paphia philippinarum* which show no indication of a cross with the local *staminea*. Part of his humorous and interesting letter follows: " Attached hereto is a package containing a sample of some bivalves that were deposited in huge quantity on our Hood Canal beach last Saturday, November 8th. They formed a neat windrow about 50 feet long, three feet wide and six inches deep, solid pack, no rocks or debris. They were not at the high tide mark but about one third out. I cleaned up the lot and am sending them on knowing your interest in juvenile bivalves. They surely are a handsome lot of " bobby sox" clams, and no two of the lot seem to be alike in their markings. Also I do not see any indications of possible mixture with the local mollusc of the same general type.

As to the crossing of the two species I may be all wet in my sherlocking of this case. As to barriers set by nature to prevent corossing species of different genera or species we must remember that while God makes the individuals, God only knows who makes the genera and species. After seeing a single genus of wasps divided up into thirty two genera in such fashion that one had to have a male to put a specimen in its genus my respect for the science of taxonomy underwent a sudden decline. In other words all of the females belonged to one genus, the males to 32."

SPECIES OF MOLLUSKS COLLECTED BY THE STANFORD EXPEDITION,L1941, TO BE ADDED TO THE LIST PUBLISHED BY H.N.LOWE,1935 (Trans. San Diego Soc. Nat. Hist., vol.8, no.6, pp 27-34).

Barbatis lurida(Sowerby)
Mytilus stearnsii Pilsbry & Raymond
Lithophaga coarctata (Reeve)
Pecten vogdesi Arnold
Crassinella pacifica (C.B. Adams)
Taras (Phlyctiderma) semirugosa (Dall)
"Lucina" lingualis Carpenter
Bornia sp.
Rochefortia compressa Dall
Erycina colpoica Dall
Aligena cokeri Dall
Trachycardium (Dallocardia) senticosum (Sowerby)
Tivela byronensis Gray
Timoclea picta (Willett)
Cumingia lamellosa Sowerby
Saxicava arctica (Linne)
Aloidis luteola (Carpenter)

Lucapinella callomarginata (Carpenter)
Liotia rammata Dall
" Cyclostrema" spiceri Baker,Hanna and Strong
Delphinoidea lucasana Baker,Hanna and Strong
Phasianella perforata Philippi
Littorina aspera Carpenter
Teinostoma gallegosi Jordan
Vitrinella sp.
Arbhitectonica granulata (Lamarck)
Heliacus mazatlanicus Pilsbry & Lowe
Aletes centiquadratus (Valenciennes)
Fartulum orcutti (Dall)
Cerithium albolineatum Carpenter
Alaba supralirata Carpenter
Trifora pazensis Baker
T. contrerasi Baker
Metaxia convexa Carpenter
M. diadema Carpenter
Cerithiopsis sp.
Litiopa cf. L. melanostoma Rang
Barleeia alderi Bartsch
Rissoina burragei Bartsch
Turbonilla stenogyra Dall and Bartsch
Odostomia (Chrysallida) contrerasi Baker,Hanna and Strong
Megalomphalus occidentalis Bartsch
Fossarus sp.
Iselica fenestrata (Carpenter)
Crepidula excavata Broderip
Strombus gracilior Sowerby
Erato columbella (Menke)
Neosimnia avena (Sowerby)

Morula ferruginea (Reeve)
Anachis costellata (Sowerby)
Mitrella granti Lowe
Nassarina sp.
Olivella anazora Duclos
Cancellaria goniostoma Sowerby
Cystiscus politulus (Dall)
Acteocina inculta (Gould)
Onchidella binneyi Stearns
Siphonaria lecanium (Philippi)
Williamia peltoides Carpenter
Melampus olivacea Carpenter
Pedipes liratus Binney

This adds 61 species to Lowe's list of 283, making a reported total of 344 for the locality. Doubtless other collectors who have since visited the region could add still more.

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Mr. Allyn G. Smith sent us the following with comments: " I copied the attached out of one of W.J. Raymond's note books. It is one of Stearns literary efforts not found in any bibliography of his writings. Apparently he sent it to Forde, who, in turn sent a copy to Raymond. ..."

YE FORDE-SMYTHE FEUDE
A.D. 1894

It was a Cowrie Greegori
  That ledde toe much discourse-
Between ye Filadelfy Forde
  and Smythe, on his high horse !

"What made ye Smythe go antick soo ?"
  Ye friends of Forde did saye-
Because his horse, a British beaste,
  Was faine toe runne awaye,

And trampe ye Cowrie Greegori
  Downe in ye very dirte,
A thing that Forde could never stand,
  A doing quite soe perte.

Soe Forde he tooke ye hunke of words,
  And threwe at Smythe, his jawe-
And Smythe hitte backe with other words,
  Like scratching with ye clawe.

And Smythe and Forde, and Forde and Smythe
  They wrestled in ye mudde-
Till all ye ground, for myles arounde-
  Was thicke with haire and blodde

con.

Then Forde got uppe and wiped hisself
  As cleane as cleane may bee,
And waved ye Cowrie Greegori,
  And shouted " Victoree ! "

Then Smythe not seeing Forde arounde,
  Full quickly he arose,
And started for ye British Isles,
  Nor stopped to wype his nose.

And after that, ye garbage man,
  Ye garbage man so smarte,
Came rounde and picked ye pieces uppe,
  Enuf toe fill ye carte. .

And gave ye same to Oistriches
  A living at ye zoo,
And every birde he ate a pecke
  Of ye delicious stewe;

Each at ye other cocked ye eye
  And said,"its much like oyster pye "
And some birds said " it is a frye,
  Made out of Cowrie Greegori."

R.E.C.S.

Copy received from John Ford, 18th April,1894.

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Mrs. Effie M. Clark, P.O. Box 511, Yuba City, Calif. Please note the present address which will be permanent.

Mrs. Clark is apparently enjoying herself working fossil deposits new to her at least. One of her most recent exploits was to collect from the San Pablo formation and has been trying to either buy or borrow a copy ' now out of print' of " Fauna of the San Pablo Group of Middle California", Univ. Calif. Publ. Dep. Geol. vol.8, no.22, Aug.230,1915, pp 385-572,pls. 42-71 by B.L. Clark. The following seems to have been a very successful initial visit.

San Pablo Formation, U. Miocene, Near Walnut Creek, Calif.
1. Anadara montoreyensis (Osmont);2. Astrodopsis tumidus Reinaud; 3. Chione pabloensis B.L. Clark; 4. Clinocardium n. sp. Myra Keen (MS); 5. Corbicula gabbiana Henderson; 6. Crepidula pabloensis B.L. Clark; 7. Calyptraea inornata (Gabb); 8. Natica diabloensis B.L. Clark; 9. Natica kirkensis B.L. Clark; 10. Neverita pabloensis B.L. Clark; 11. Pecten cf. crassacardita (Conrad); P12. Pecten raymondi B.L. Clark; 13. Pseudocardium pabloensis ("Packard" Clark); 14. Pseudocardium gabbi (Remnond) ; 15. Protothaca staminea Conrad; 16. Platydon cancellata (Conrad); 17. Spisula cf. allaria (Conrad); 18. Tivela diabloensis B.L. Clark; 19. Tivela gabbi B.L. Clark.

Mrs. Clark wrote that she greatly appreciated the work given her by Dr. A. Myra Keen of Stanford University in classifying these specimens.

NOTES ON THE FAUNA OF SAN ONOFRE, ORANGE COUNTY, CALIFORNIA

By John Q. Burch

The rubble reef about one half mile south of the railway station at San Onofre has been a favorite collecting locality for many years and specimens so labelled will no doubt be found in all large collections. San Onofre is now in the reservation of the United States Marine Corps and it is necessary to get a permit from the Post Provost Marshal before entering. Colonel R.L. Peterson was very courteous and cooperative and issued the proper papers. Mr. a nd Mrs. John Q. Burch and Mr. and Mrs. Jim Bailey worked the minus tide on November 29. Inasmuch as this rubble reef has probably been untouchedsince before the war, we were expecting to find a great increase in the fauna but this is not the case. The same interesting species are still there but apparently in no greater number than before, nor did we find anything not previously recorded from this locality. No attempt will be made here to give a faunal list, but the following observations may be of interest to some.

Amphineura

Leptochiton rugatus (Pilsbry,1892). This small flesh colored species with the red body ranges the length of the coast, but the experience of most collectors is to find it moderately rare. However, at San Onofre it is quite abundant under the stones about the middle of the intertidal zone.

Ischnochiton (Stenoplax) conspicuus Pilsbry,1892. The reason to mention this common species here is that the specimens from San Onofre seem to attain exceptional size and are also very abundant.

Pelecypoda

Arca pernoides Carpenter,1857 (Arca bailyi Bartsch). This small species is not rare in the intertidal zone from Santa Monica southward, but the abundance of them at San Onofre is remarkable. Nearly every stone around mid tide will produce a score of specimens.

Taras orbellus (Gould). San Onofre is characterized by the profusion of worm tubes and Chama beds. Nestling in this growth will be found great numbers of this species. The habitat is of interest only because Taras is usually more abundant on the mud flats of the estuaries, Mission Bay for example being a favorite locality.

Protothaca staminea spatiosa (Dall),1916. We placed this subspecies in the synonymy of the typical and consider it of no significance. However, if anyone wishes to attempt a division of staminea the San Onofre specimens will probably be found to fall into Dall's spatiosa.

Semele decisa (Conrad)- Our records show that San Onofre was the site of a very large colony of this species back around 1935-1936 at which time we took hundreds of large and perfect specimens. It is still there but is now comparatively rare.

Con.

Mactra nasuta Gould. Our experience has been to place this among the really moderately rare species. It is not uncommon at San Onofre in the sandy spots between the rubble.
Aloidis luteola (Carpenter)- (Corbula) . While not uncommon in shallow dredgings off shore between 10 and 20 fathoms in our experience, this is rather an unusual species in littoral collecting. It is common at San Onofre under stones, not at the deepest but about the middle of the intertidal zone.

Nudibranchiata. A number of beautifully colored species of this order were to be seen largely on the eel grass.

Gastropoda

The typical rock fauna of southern California was evident in great numbers.
Zonaria spadicea (Swainson). This species as well as Pterynotus trialatus (Sowerby) almost certainly come in at certain periods, and the date on the calendar will vary from year to year. In November of 1937 we found P. trialatus so abundant that one collector brought back a casual collection of more than 80 specimens. Zonaria has been reported taken here by thousands. The old story of the two collectors who took 2,000 here at one tide is at least a good yarn. However, one specimen of each was taken by four of us indicating the scarcity at this time.
Cerithiopsis antemunda Bartsch was found on the yellow sponge.
Acmaea asmi Middendorff was common on Tegula gallina (Forbes) and an occasional specimen of Tegula was commensal with Crepidula excavata Broderip in the deeper water while farther up we found them only with Crepidula onyx Sowerby.
Norrisia norrisii (Sowerby) was not uncommon and usually accompanied by the form Crepidula norrisiarum Williamson for those who attempt to divide C. excavata.
Megathura crenulata (Sowerby). This locality seems to have been for many years a nursery for the young of this species. The amateur collector on first finding great numbers of this small fissurelid is certain to have a thrill thinking he has something new. Juvenile specimens of Megathura measuring less than one half inch are very abundant. It is an observation of some interest that while we find these small juveniles common at San Onofre the adults are extremely rare. On the other hand the writer at least has never taken one of these juveniles from the San Pedro or Santa Monica breakwaters for examples where the large adult Magathura appears in great numbers.

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PUBLICATIONS RECEIVED

Dexter, Ralph W. : The Marine Communities of a Tidal Inlet at Cape Ann, Massachusetts: A Study in Bio-Ecology. Ecological Monographs, 17: 261-294,July,1947. This is a very detailed study based largely on the quantative conclusions.

Dodge, Henry: The Molluscan Genera of Bruguiere. Jour. Paleon. vol.21, no.5, Sept.,1947. This excellent paper will answer a number of questions that have confused many and a study of it is likely to cause a few changes in names of authorities.

Gifford, E.W.: California Shell Artifacts. Appendix: Additional Bone Artifacts by Phil C. Orr. Anthropological Records 9:1. University of California Press, Berkeley and Los Angeles. Nov.7,1947. Price $2.00 132 pages the last 64 being plates.
This work is certain to be of interest to a studnt of shells. Dr. Gifford must have had some puzzles to solve in determining the exact species of mollusk from which many of these things were ground.

Haas, Fritz: Malacological Notes-V. Fieldiana-Zoology vol. 31, no.22, Oct. 27,1947. Published by Chicago Natural History Museum.
In this fine paper Dr. Haas has combined a number of different pieces of work. Peruvian Land and Fresh-Water Shells in which a number of species are discussed and figured and one new species described. Succinea patula Leach, an Overlooked European Shell. On the Genus Nesonanina C. Boettger. A New Species and Genus of Gastropod. This describes a new small shell from Saipan. Shell Sculpture in Normally Smooth Unionid Shells. Remarks on Cyclas Incurva Guppy.
Every conchological library should receive Fieldiana.

The Annual Report of the Chicago Natural History Museum. A very impressive report on the many activities of this great institution.

Hubendick, Bengt: Die Verbreitungsver-Haltnisse Der Limnischen Gastropoden in Sudschweden. Sonderabdruck Zoologiska Bidrag Fran Uppsala. Band 24. 140 pages, large folding charts ..

Hubendick, Bengt: On South African Siphonariidae. Annals of the Natal Museum, vol. 11, pt.1, Jan.,1947. 4 pp.

Hubendick, Bengt: Phylogenetic Relations between the Higher Limnic Basommatophora. Sartryck ur Festskrift Tillagnad Prof. Nils von Hofsten- Zoologiska Bidrag Fran Uppsala Band 25.
This scholarly paper is in English.

California Fish and Game, vol. 33, no.4, Oct.,1947. This issue is largely devoted to a well illustrated paper by Herbert A. Jensen, A System for Classifying Vegetation in California. At first glance this may seem far from conchology, but it is an effort to standardize the nomenclature used for the vegetation and should be used or rather could be used to great advantage by collectors of land snails. Many lost localities of species could no doubt be located if the original collector had simply listed the vegetation of the vicinity.

Fisheries Newsletter, published by the Commonwealth Fisheries Office, Dept. of Commerce and Agriculture, Sydney, Australia The April,1947 issue contains a well written and well illustrated paper by Joyce Allan, Australian Museum on The Trochus. The June,1947 issue contains a number of interesting articles on oysters- Biology and Cultivation of Oysters by G.L. Kesteven, New South African Effort to Establish Oyster Farming, Extensive trade in Philippines,Pests that Prey on Oysters etc.

Criteria for Vertebrate Subspecies,Species and Genera, Annals of the New York Academy of Sciences, vol. XLIV, art.2, pp 105-188 by C.M. Bogert, W.F. Blair, E.R. Dunn,E.R. Hall, C.L. Hubbs, E. Mayr, and G.G. Simpson. June 8,1943.

This excellent paper has no doubt been overlooked by many students of the invertebrates who could read it to great advantage.

Circulares De La Sociedad Malacologica " Carlos De La Torre" Museo Poey, Universidad de la Habana. Oct. 15,1947 pp 71-78.

This issue contains a complete list of the members as well as interesting personalia.

Bulletin of the Conchology Club of Auckland, New Zealand. Sept. 1947. The two pages of very excellent notes from talks made by Dr. A.W.B. Powell should be added to the library of all in any way interested in the New Zealand fauna. They are devoted to the Cassidae and the Pectinidae.

Shell Notes by Frank Lyman, November,1947. This issue is in 20 pages and Frank keeps up the standard of interest throughout. This is the beginning of his Vol.2.

Nature Lore, Nov. 1947 Vol. 1, no.1. Published monthly by the Agassiz Nature Club, Long Beach, Calif. Two pages mimeographed and discusses the affairs of the club including those working with mollusks.

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MINUTES OF THE CONCHOLOGICAL CLUB OF SOUTHERN CALIFORNIA- Nov.

An unusually small group gathered at the Los Angeles County Museum for the monthly meeting of the Conchological Club of Southern California. We were glad to have Dr. Arthur Howard back after his illness.

There were no committee reports. The chairman Dr. W.O. Gregg appointed the following on the nominating committee to report at the December meeting: Mr. E.P. Baker chairman, Mrs. E.P. Chace and Mr. M.E. Caruthers.

Mr. John Q. Burch for our information told of his appointment by Dr. A. Myra Keen , president of the American Malacological Union, to the chairmanship of a committee to select the time and place for a meeting next spring to formulate plans for the possible organization of a western branch of the Union for the West Coast. Mr. Burch also spoke of the difficulties of making up the Minutes. Appreciation of his work was expressed and offers of assistance made.

Dr. Gregg gave a scholarly talk on the Lymnaeidae of Western North America. His collection of finely mounted specimens was most interesting. Respectfully submittes, Harriette Gillis

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Mr. and Mrs. H. Carroll McGowan, 603 N. Alisos St., Santa Barbara Calif. Please note the new address. They now have plenty of room for both family and shells and while talking about family the newest arrival Walter Carroll, born Aug. 11th should by all means be added to the membership roster.

Professor Herman W. Miller , from Costa Rica is still in the hospital at 312 No. Boyle Ave but says he is doing well. One of our members visited him and reported that he looked well. We hope to have him at a meeting before his return.

Harold P. Post, Chesterfield, N.H. has joined the trek to Florida for the winter.

Walter J. Eyerdam, 7531 19thb Ave., N.E., Seattle, Wash. The photograph of a long row of *Panope generosa* hung on a line by the siphons bears the comment" The Indians had a good reason for calling Panope generosa a gooey duck or goeduck." Anyway whatever the Indians had in mind they really do resemble ducks when tied up in this manner. Mr. Eyerdam discussed the value of a good specimen of *Pleurotomaria* and stated that in his opinion they should be worth $100. or more each since they sold for that much back in the days of the depression. However, there seems to be no danger of flooding the market with them at any price. Who has some ? Incidentally another question is in order here. How many species of living *Pleurotomaria* are there ? I have never seen anything other than *P. hirasei* from Japan.

Mrs. Lida B. White, Belle Vista Beach, St. Petersburg 7, Florida We were filled with admiration and no little amazement recently when Mrs. White drove up to our place, her car full of fine Mexican shells. Many of our members of boasted pioneer stock prepare for a trip to Guayas and West Mexico as if it were an African safari to the wildest parts. Hence we were more than a bit interested to learn that Mrs. White had just casually and all by herself driven her car down to Guaymas, collected as many fine shells as her car would hold, enjoyed a few weeks and driven on back. The last we heard she was visiting in Santa Barbara but we hope to see her again before her return.

Morris K. Jacobson, 455 B. St., Rockaway, N.Y. " ... a trip I plan to make during the Christmas recess to pay a visit to Alcalde in Cuba and go collecting with him in the province of Pinar del Rio" On his return it is to be expected that a good many letters will be waiting in the general tone of " you know me, Morris". Another interesting note and from a new source to us anyway is " I received a shipment of 225 land, freshwater and marine molluscs from Dr. George Haas of the Hebrew University in Palestine." Another note that perhaps may be answered by some of our members " We had a nice trip home with a stopover at Pyramid Lake where I simply waded through some interesting fossil shells. Have been trying to get references to this lake with no success." " Collected beautifully at Morro (will be back there next summer I hope)."

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Long Beach Shell Club- At the meeting of Nov.9,1947 the speaker was Dr. H.R. Hill of the Los Angeles Museum who spoke on the Terebridae. The next meeting is the annual Christmas party to be held at the Ulrichs, 1049 Island Ave., Wilmington, Dec. 14th.

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Dr. and Mrs. H.R. Hill leave shortly for a month's excursion to visit Florida and Cuba.

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